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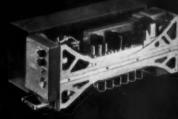
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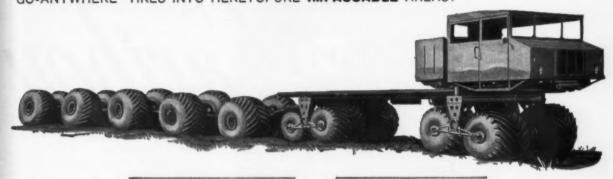


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Wayne W. Parrish Editor and Publisher Joseph S. Murphy Executive Editor Stanley C. Jensen Managing Editor
Eric Bramley
DEPARYMENT EDITORS DeWitt Ballew Business News Betty Oswald Defense George Hart Technical Bill Combs Engineering Robert Burkhardt Transport Mel Sokol Airports Clifford Allum Business Flying Richard Golden CAB Charles Schaeffer Congress Gerald A. Fitzgerald Airline Economics Wallace I. Longstreth Cargo Fred S. Hunter West Coast Richard van Osten West Coast Richard van Osten West Coast Anthony Vandyk International Jean-Marie Riche Paris Sam P. Saint Contributing Operations Selig Altschul Contributing Financial Jewelle Magarity Editorial Assistant
PRODUCTION
William H. Martin
EDITORIAL AND BUSINESS OFFICES
Lawrence L. Brethner, Circulation Director; George F. Peterson, Research Manager; Fay D. Crowley, Advertising Service Manager; Stephen A. Rynas, Advertising Promotion Manager; 1001 Vermont Ave., N.W., Washington S, D.C., U.S.A. Phone: Sterling 3-5400. Cable: AMERAV.
REGIONAL OFFICES
New York City: 17 East 48th St., New York 17, M.Y., Robert Weston and Frederick W. Pratt, regional advertising managers. Phone: Plaza 3-1100. West Coast: 8929 Wilshire Boulevard, Beverly Hills, Calif., Fred S. Hunter, manager. Phone: Oleander 5-9161 and Olympia 7-1555. Canada: Allin Associates, 12 Richmond Street East, Toronto I, Ontario. Phone: Empire 4-2001. Allin Associates, 1487 Mountain Street, Suite 4, Monfreal, Quebec. Chicage: 139 N. Clark St., Chicago 2, Ill. Richard E. Helwig, regional advertising manager, Phone: Centrel 6-5804. Detroit: 201 Stephenson Bidg., Detroit 2, Mich. Phone: Trainty 5-2555. Kenneth J. Wells, regional advertising manager. Cleveland: 244 Hanna Bidg., 1422 Euclid Avenue, Cleveland 15, Ohio. Phone: Prospect 1-2420, Donald E. Murray, regional advertising manager. Florida: 208 Allmeria Ave., Coral Gables, Fla., Richard D. Hager, sales representative. Phone: Highland 4-8326. Ganeva: American Avistion Publications, 10 Rue Grenus, Geneva, Switzerland. Anthony Vandyk, European director. London: The AAP Company, 17 Drayton Road, Boreham Wood, Hertfordshire, England. Phone: ELStree 288. Cable Address: STEVAIR, London, Paris: Jean-Marie Riche, 11 Rue Condoncet, Paris (9e). Phone: TRU 15-37. Cable Address: NEWS-AIR PARIS.
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AIRTRENDS	
Military	13
Manufacturing/Design	14
Transport	
Airports/Airways	48
NEWS FEATURES	
Strike Costs—A Million-Plus Per Day	19
Rolls-Royce Jet Heightens Interest in Caravelle	20
Banker Blasts CAB Fare Policies	20
GE to Get \$27.5 Million for AA Engines	21
Aircraft "Curb Market" Organized	21
Congress May Probe A-Plane Lag	22
Aircraft Sales Decline	22
News Briefs	23
Defense Angles	23
MAINTENANCE & OVERHAUL REPORT	
Turbines Are Creating a Real Problem	24
Contract Operators Diversify or Disappear	27
Maintenance Pool Pays Dual Dividends	28
ENGINEERING & DESIGN	
Flight Report on the '59 Helio Super Courier	32
MATERIALS & EQUIPMENT Delta Pays for Crane With Saved Man-Hours	37
Engine Container Cuts Transport Costs	37
AIRPORTS & HELIPORTS	
Asphalt-Concrete Feud Drags On	43
BUSINESS FLYING	
Fuel Injection Engines Boost 310C Performance	44
TRANSPORT AVIATION	
The Soviet's Breathtaking Aviation Plans	51
CAB Report & Forecast	55
DEPARTMENTS	
Personal View	5
Letters	10
When & Where	10
People	38
International Report	54
West Coast Talk	56
En Route	58
Aircraft Data Cards	
Northrop N-156F, McDonnell F-101C, Dassault Super Mystere B-2	59
	5
	2

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Mandatory Arbitration Must Replace Strikes

Strikes must be ruled out of all public utility industries.

Under today's setup of government machinery, there is not a single, solitary labor issue which should not be—and cannot be—resolved by arbitration.

Arbitration must become mandatory.

The current siege of airline strikes, threats, ultimatums, court actions, and efforts by unions to usurp the prerogatives of management is a shameful commentary of a so-far tolerant American scene.

The Railway Labor Act was legislated by Congress to set up machinery to avoid the interruption of interstate commerce and to protect employe and employer rights of self-organization and association, and the orderly settlement of disputes.

In air transport the Railway Labor Act has failed but it has failed only because some parties—chiefly the unions—have been determined to meet their objectives by any means at their command even to the extent of spurning arbitration and other machinery.

The airlines are public carriers. The price of their product is controlled by the government, as are many of their other activities. But the unions are not controlled. Neither are their demands. Responsibility can be exercised properly only by arbitration in the public interest, since in the final analysis it is the public that pays for the cost of the services.

The cost of this year's strikes has been appalling. A great many people, including a great many workers, have been badly hurt. The country's economy has been hurt. The traveling public has been severely inconvenienced. And all because of strikes which cannot be justified by any conceivable yardstick of reason or common sense.

Local IAM union leaders Robert Quick of Capital, Cliff Miller of TWA and George Brown of Eastern, would find it to be an enlightening experience to try to explain their curious labor philosophy to Europeans and Russians. How to cripple companies, how to throw thousands of workers out of work (especially before the holidays), how to hurt the economies of cities and how to inconvenience hundreds of thousands of passengers—that is indeed a philosophy which needs explaining abroad to people who have had other ideas about America.

Then there is the pilot-flight engineer brawl, an incredible, fantastic chapter, plus the salary and other demands of some elements of ALPA which cause gasps not only in the U.S. but which loom to astronomical proportions overseas.

There could not be any possible justification for a strike over either the flight engineer issue or jet contracts. How any union expects to benefit from a strike so costly in revenues, wages and public convenience, is a morality which few can understand. Not only does nobody win a strike, but a strike is a brawl, inciting hatred and creating wounds that never heal.

There was a time when the only final resort of underpaid workers was a strike. In these days of acceptance of higher standards of living and far better working conditions, and government machinery available for settling labor disputes, a strike can only be considered to be an exercise of abuse. And in some instances strikes are built-in motivations by local union leaders who have to get their power demonstrations out of their systems, no matter what the cost to others.

The disavowal of secret balloting by IAM unions in Capital and TWA is evidence enough of the rash abuse of power by union leadership on the local level.

Unions have become big business in the United States. As long as they are, then they should be balanced against industry in equal fashion. Mandatory arbitration is the only possible solution, else by the use of calamitous dislocations due to strikes, the air transport industry will become nothing but a pawn of power-hungry union leadership, and always at war.

ALPA, IAM and FEIA had all best do some sharp thinking. The days of mail subsidy when higher labor costs were dumped into the hopper for higher mail pay requests have long since passed. Today there are stockholders who are concerned. Other employes are getting pretty tired of having their income cut off. And the public is not exactly sympathetic to strikes based on salaries and working hours that are far, far above the national average.

Strikes began as rights and privileges. When they merge into the area of abuse and injury, the signs begin to appear that enough is enough. Mandatory arbitration must of necessity be the sole outcome.

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SPECIAL PEATURES

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- 3. Strip-transmission line directional
- 4. Signal generator
- 5. Calibrated strip-transmission line attenuators
- 6. Power monitor
- 7. Pulse spacing network
- 8. Portable and lightweight
- 9. Adaptable to ramp test set

SPECIFICATIONS

- 1. Frequency range: 950-1220 mc/sec.
- 2. Double pulse generator with independent amplitude control. Repetition rates from 15-2,000.
- 3. High Q wavemeter, 950-1220 mc/sec.
- 4. Direct reading attenuators.
- 5. Pulse spacing direct reading, 1-30
- 6. Power monitor; meter reading average of peak power.
- 7. Portable, lightweight aluminum chassis and carrying case with handles.
- 8. Weight-59 lbs.
- 9. Dimensions: 21" wide x 12" high x 18" deep.
- 10. Standard relay racking.
- 11. Finish grey enamel.
- 12. Power requirements: 115 volts
- AC, 50-440 cycles per sec.-150 watts.





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LETTERS.

Kudos for Custer

The straight, factual report entitled "Channel Wing's Second Chance" (A/A Nov. 17, p. 45) made gratifying reading, since for many years biased articles have sniped at this patented invention. As a space research scientist who advocates directly powering the lift plane for omnidirectional reaction and one who is opposed to political extravaganzas which limit all effective research to restrictive unilateral motion and power application to drag plane, my feelings are with any inventor who can protect his own against odds.

Del Santee, Aerophysics Consultant AIRco, Florida

Degrees Not Percentage

In your October 6th issue the description of the 3"-round AutoTemp E.G.T. and Turbine Inlet Temperature Indicator manufactured by B&H Instrument Co., of Fort Worth, noted its accuracy as ±1% . . . in the 500° to 1000°C range.

The percentage figure therefore suggests an accuracy within a range of 20 degrees maximum whereas the accuracy of the AutoTemp actually is 1°C plus or minus!

Stine Kotula The Kotula Co., New York, N.Y.

Credit Is Due

The author of the Lockheed history "Of Men and Stars" which you praised in your editorial of October 6 is Mr. Phil Juergens of Lockheed's Public Relations Department. He should be personally credited for this excellent work of aviation history.

Charles C. Waugh, President Waugh Engrg. Co., Van Nuys, Calif.

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Dec. 16 Fourth Convertible Aircraft Congress, Franklin Institute, Philadelphia.

Dec. 16—Joint Industry-Army Aviation Symposium, sponsored by Aeronautical Training Society and The Aircraft Service Assn. Mayflower Hotel, Washington, D.C.

Dec. 17—The Aircraft Service Assn., annual meeting, Washington, D.C.

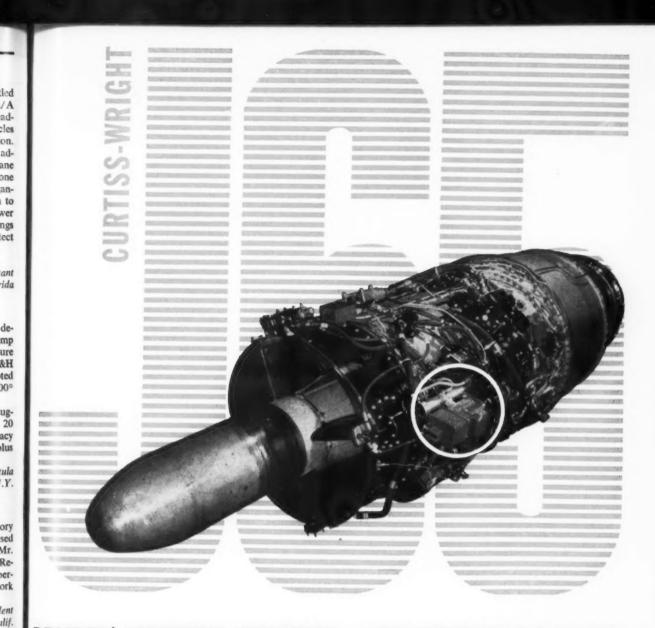
Dec. 17—Institute of the Aeronautical Sciences, Wright Memorial Dinner, Sheraton-Carlton, Washington, D.C.

JANUARY

Jan. 12-16—Society of Automotive Engineers annual meeting, Sheraton Cadillac and Hotel Statler, Detroit.

Jan. 28-29—IAS 27th annual meeting, Sheraton-Astor, New York City.

Jan. 27—Institute of the Aeronautical Sciences honors night dinner, Sheraton-Astor, New York City.



BENDIX* IGNITION SYSTEMS—FOR THE BEST IN JETS

The powerful Curtiss-Wright J65 jet engine shown here is equipped with the Bendix TMGLN ignition system, the first self-contained ignition system to be developed for jet engines.

Produced by Scintilla Division of Bendix Aviation Corporation, it is one of a variety of type of ignition systems designed and manufactured by this division for the large, modern turbojet and turboprop engines.

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DECEM

tes

One reason why Russia grabbed the lead in nuclear-powered aircraft is the DOD-imposed requirement that a U.S. A-plane should have Mach 3 capability when conventional aircraft have yet to reach that speed. But it probably won't end there. By setting requirements for new systems so far in excess of known techniques, the U.S. is being robbed of radical new weapons. At the least, the restriction is a prime stumbling block to progress.

Drones and lightplanes are due for intensive Army development. Maj. Gen. August C. Schomburger, deputy chief of Army Ordnance, describes the problem of combat surveillance as one of the roughest.

New metal base fuels for military aircraft are arousing stronger interest. Basic aim is to cut fuel consumption and increase range by jacking up the energy content per pound of fuel. Another goal is to boost combustion efficiency and thus reduce flameout hazard. Interest still centers in boron type fuels with evidence slowly being accumulated that boric oxide problems will be solved.

A push is on for a nuclearpowered ramjet. Since any nuclear jet suffers a weight penalty by requiring auxiliary chemical power to attain maximum speeds, the theory is to use the simplest kind and have the chemical engines boost the aircraft to a speed where the ramjet could take over.

A cheap way for DOD to spur industry work in basic research is to hike the limit on such costs now allowed as part of overhead. Trouble is that present allowance is too small and auditors and procurement officers frequently try to eliminate or hold the percentage so far down that industry feels justified in dragging its feet.

Major shake-up of Navy and Air Force research effort is due after Jan.

1. Big question is whether the new changes can be delayed until Defense Secretary Neil McElroy finds a Director of Research, Engineering. Chances are looking up that Roy Johnson, present director of Advanced Research Projects Agency, may be tapped for the post. Johnson is already serving at the Pentagon, and the fate of his organization may be uncertain when the Congress returns even though Mr. McElroy talks of the agency on the same level as Army, Navy, Air Force and Marine Corps.

Renegotiation mess is sure to create a major furor on Capitol Hill when hearings start. Industry efforts to save money are being discouraged by proceedings that recapture profits resulting from cost trimming on incentive-type contracts. Renegotiators argue that if savings are substantial, the target costs very likely were set too high in the first place.

Aeronautics research didn't die with NACA. This is the assurance that the National Aeronautics and Space Administration can be expected to give manufacturers, airlines, engine builders and government agencies.

There's bad news for Army, Navy and AF information officers. When the changeover takes place early next year, control of the joint and specified commands by Defense Secretary McElroy directly will force a change in information policy.

Tests on the X-15 may be delayed. Starting date depends on whether the "dry" lake at Edwards AFB is really dry. Current prediction is for heavierthan-usual rainfall coming at the wrong time.

TION

Cost cutting may mean life or death to the B-58 Hustler program. How long the speedy bomber can be produced is likely to depend on how many of them can be produced with the dollars available, and Convair is now in a hard drive to pare off financial fat.

First two Convair 880s are scheduled for rollout this month. First will go to field operations preparatory to flight test early next year. Second will be used for structural trials of design before the flight test. Present production rate of 25 days between planes will be reduced to 17 days later.

Beech has a real stake in the Bell X-14. The Wichita manufacturer has supplied wings, ailerons, fins, rudder, stabilizer, elevators and landing gear for this STOL aircraft which may be the basis for a new Air Force-Navy fighter.

Mach 3 transport is more than a gleam in at least one manufacturer's eye. It is being described as well within the state of the art even though it isn't likely to be built without military support for some time. Idea seems to be that such an aircraft could eliminate the normal growth potential of first families of jet transports.

Dissimilar metals will be weldable soon as a result of the development of a new ultrasonic seam welder by Westinghouse Electric Corp. Work is continuing to increase welding speed and to increase thickness of metals that can be welded.

Jet instrumentation activity continues to buzz in the wake of KC-135 crash at Westover AFB. Latest development: Speed Control and Takeoff (SCAT) system by Safe Flight Instrument Corp., White Plains, N.Y., to guide jet pilot from VR

(rotational speed) to his steady-state climb speed.

Taking the man from the machine doesn't eliminate man, manufacturers are discovering. Automation means increasing maintenance and more skilled employes.

Rolls Royce is aiming at hiking cruise speed for the Dart turboprop. However, speeds of about 450 mph are still considered the economic maximum for propeller driven aircraft.

The automatic factory isn't here yet, but a major break in the battle to find an economic means of producing many different aircraft parts in relatively small lots with general purpose equipment may be won. The answer: The use of numerically controlled milling machines. Af program which includes original development of numerical control, and the procurement of about 105 machines cost a total of \$30 million to date.

Manufacturing process for extra wide alloy and nickel alloy plates is subject of search by Air Materiel Command. Big question is how many companies ought to be put to work and on what basis.

One of Douglas Aircraft's precautions against explosive decompression in the DC-8 is the installation of titanium rip stoppers in the fuselage. They're exactly what the name implies. If, by chance, there is a break in the aluminum skin the rip comes to a stop at the titanium.

Tilt-wing principle for both VTOL and STOL may already be established by the test results of the Vertol 76 on more than 15 complete conversions. More work is needed, however, to exploit the aircraft's basic high-speed capability.



Delta Air Lines passengers enjoy unexcelled luxury aboard DC-7

passenger agent expedites check-in, three stewardesses assure fast baggage handling, many extra luxuries but no extra fare! Entrées are chosen from Steak broiled to order, Rock Cornish Hen-or Seafood on appropriate days. A special airport personal service, there's music, beverage service,

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BRITANNIAS are flying over 80,000 miles daily on the world's trunk routes—cutting previous scheduled times by an average 20%, setting new standards of comfort.

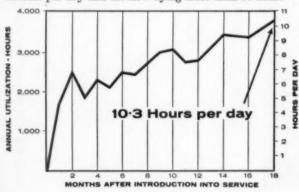
BRITANNIAS have now been operating for two years on some of the world's most exacting routes — in extreme climates — <u>from diverse runways</u> — on stages ranging from short inter-city hops to the longest transpolar flights.

How have they rewarded

Facts and figures of the operators themselves—these provide the conclusive evidence. They bear witness to the soundness of the basic Britannia concept. They prove the Britannia in airline service to be exceptionally reliable, capable of attracting new traffic, and immensely flexible. In a word—profitable.

1 Reliable. Britannia's jet-prop engines have established an all-time record, since life between overhauls on the Proteus 705 has been raised by the Air Registration Board to 1,600 hours after only 18 months' service—a rate never before achieved by any engine, piston or turbine. "Engines virtually trouble-free"—El Al. "New standard of mechanical reliability... nearest approach to ideal propulsion unit for transport aircraft"—Aeronaves.

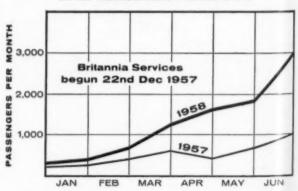
2 Steadily rising utilization rate. Here again aircraft reliability tells. After a year in service with BOAC, Britannia 100 series were achieving 8 hours per aircraft per day and are now flying more than 10 hours—



3,780 hours per annum. After eight months in service with El Al, Britannias were already achieving 8.4 hours per day.

3 Attracting new traffic. On transatlantic routes this year Britannia operators have achieved some of the highest load factors ever recorded—despite a substantial drop for all carriers. During the first 6 months, BOAC's Britannias were 80.2% full.

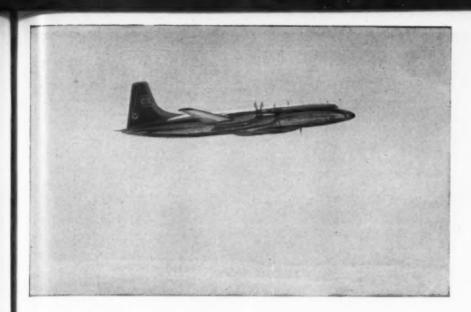
EL AL TRANSLANTIC PASSENGERS



Since introducing Britannias, El Al have trebled their share of transatlantic traffic, while Canadian Pacific on their transpolar Vancouver – Amsterdam route gained a 32% increase in westbound traffic over the same period last year.

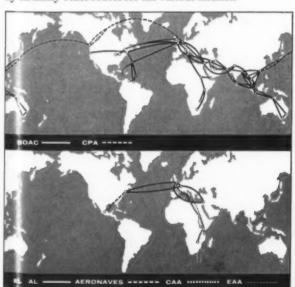
On commonwealth routes, Britannias have flown 420 million seat miles, 296 million passenger miles—a load factor of 70%.

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THE OPERATORS?

4 Flexible. Britannias fly on stage lengths varying from 300 to 5,000 miles. Routes include: with BOAC, London – New York – San Francisco, London – Montreal – Chicago – Detroit, London – Bermuda – Caracas, on African routes to Johannesburg, and on the Far East routes to Tokyo, Sydney, Melbourne; with El Al Israel Airlines, Tel Aviv – New York, calling at Paris, London; with Aeronaves de Mexico, Mexico City – New York; and with Canadian Pacific Transpolar, Vancouver – Amsterdam, and Trans-Pacific, Vancouver – Tokyo – Hong Kong. Britannias also fly on many other routes for the various airlines.



5 Non-stop transatlantic regularity. During the first six months of this year, El Al scheduled and made 183 transatlantic crossings. Only once did extra severe headwinds force an intermediate stop.

This 100% regularity continued when El Al were operating as many as five return services a week between Tel Aviv and New York with only three aircraft. El Al has recently taken delivery of a fourth Britannia; services are to be still further increased.

All these factors add up to— PROFITABILITY

The sum total of success in all these factors is contained in one word: profitability.

El Al's experience bears this out. Their Britannias are operating at a ton/mile cost approximately 20% less than any previously experienced.

Britannia

BRISTOL AIRCRAFT LIMITED . ENGLAND

THE BRISTOL AEROPLANE CO, (USA) INC, 400 PARK AVENUE, NY22, NY

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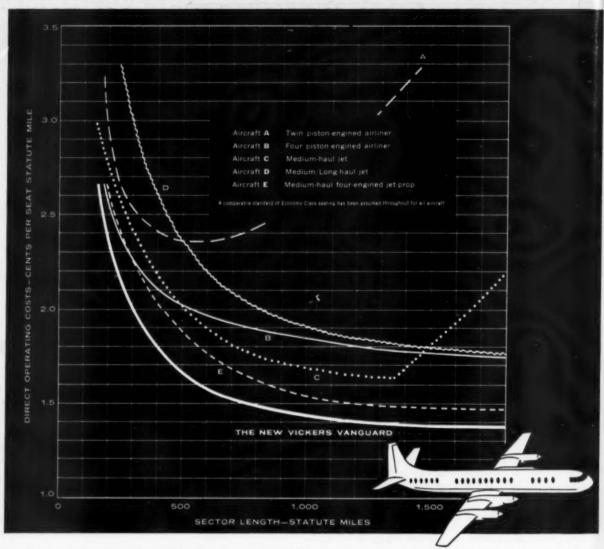
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AIRLINE REPORTS LOWEST SEAT-MILE COSTS

A recent impartial evaluation by one of the world's leading airlines showed that the new jet-prop Vanguard will offer the lowest seat-mile operating costs on all sectors from 200 miles to 2,000 miles. The Vanguard, with a maximum payload of 29,000 lb. and a 139-seat configuration, was compared to five other modern airliners for economy class jet age service—including British and American pure jets and jet-props.

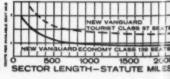
HIGHEST PROFIT POTENTIAL

To most American carriers in the jet age, the Vanguard will offer a profit potential at least 35% higher than that of any comparable airliner—and twice that advantage on economy configurations. Many factors contribute to Vanguard profitability on all ranges up to 2600 miles. Rolls-Royce jet-props have proved their reliability and ease of maintenance. Simultaneous on-and-off loading of both passengers and freight permits fast turnaround. On high-density routes, the Vanguard is the biggest profit-earner ever offered to the airline industry.

The Vanguard's large, well-balanced passenger/freight capacity makes possible high utilization and high profits even on off-peak services. Because of its smooth, silent comfort and speeds that will be competitive with jets on short-to-medium ranges, the Vanguard offers strong passenger appeal that makes for good load factors.

For detailed specifications and a cost analysis based on your operations, contact Christopher Clarkson, U.S. representative, 10 Rockefeller Plaza, New York 20, New York.

The chart at the right shows the Vanguard's direct operating costs, and is based on A. T. A. costing methods. The figures are representative for American carriers. Note that Vanguard costs will be about \$\frac{12}{2}\$ per available seat mile on 100-mile sectors—and under \$1\frac{1}{2}\$ on all sectors over 900 miles.



VICKERS VANGUARD

POWERED BY FOUR ROLLS-ROYCE TYPE ENGINES

VICKERS-ARMSTRONGS (AIRCRAPT) LTD. • WEYBRIDGE, ENGLAND • MEMBER COMPANY OF THE VICKERS GROJP

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Strike Costs - A Million-Plus Per Day

- Capital and TWA dropped more than \$22 million
- Eastern alone is losing nearly \$750,000 a day
- And the "Third Man" problem's still unsettled

By Eric Bramley Chief News Editor

The airlines' serious problem—labor—moved into the critical stage at presstime as a series of strikes, strike threats, strike endings and a 13½-day simultaneous shutdown of two of the Big Four carriers disrupted U.S. air transport operations.

Because of unsettled jet contracts for pilots, the worst seemed yet to come.

And of major concern to the airlines is the threatening prospect of increased dealings with James R. Hoffa's International Brotherhood of Teamsters.

Settlements with International Association of Machinists came after two strikes—38 days at Capital, 15 days at TWA—that hit with terrific economic impact. Eastern's mechanics and flight engineers were still on strike at presstime. National, Northwest and Northeast had signed IAM contracts without strikes.

Capital lost \$10 million to \$11 million in revenue during its walkout. TWA dropped \$12 million. EAL's passenger revenue loss was estimated to be running \$750,000 a day.

It is now estimated that \$37 million will be added to the payrolls of six airlines over a three-year period as a result of the IAM settlements. This assumes an EAL contract along the same lines as Capital, NAL, NWA, NEA and TWA.

An added worry is that these threeyear contracts are retroactive to late 19:7—meaning that the airlines must ant: up millions to cover wage increuses now due and payable.

A Presidential emergency board had recommended a 20¢ raise over two years. The six airlines accepted, IAM refused. Final result: Raises in the 44¢ range over three years.

Settlement at the emergency board's figure would have boosted the wage bill \$16 million in two years.

The economic impact of the strikes: Each striking Capital mechanic lost about \$750 in wages, the entire IAM group losing some \$2 million.

Each Capital pilot suffered a \$1,850 loss, or close to \$1 million for the group.

Other employes dropped \$2 million that will never be recovered.

Nine cities on Capital had no air service. Suppliers—fuel companies, caterers, etc.—suffered major losses. Example: Capital's fuel consumption during the strike period would have been about 2 million gallons.

At TWA, lost wages cost IAM an estimated \$1.1 million, pilots \$880,000, other crew members \$378,000, cabin attendants \$202,000, other employes \$1.9 million.

Unable to furlough foreign nationals in its employ, TWA kept them on the

payroll at considerable expense.

TWA's fuel suppliers lost \$1.8 million in sales.

In the first 13 days of the EAL strike, mechanics had lost \$850,000 in wages, flight engineers \$200,000, other flight personnel \$1,250,000, ground personnel \$1,250,000. The avgas and oil bill for the period would have been \$2 million. Eighteen cities on EAL were without air service.

EAL had eight brand-new \$2 million Lockheed Electras sitting on the ground, idle. They were to have gone into service Dec. 1. Pan American, whose regular pilots are not flying jets in the absence of a contract, was suffering loss of utilization on its Boeing 707s because of the limited number of supervisory pilots available for flights. American claimed that the mere threat of a pilots' strike was causing it to lose revenue. It sued ALPA for \$90,000 a day, retroactive to Nov. 23, when the union threatened a strike.

EAL, in addition to the IAM walkout, was struck by Flight Engineers International Association because of the company's agreement with its pilots that engineers on jets would hold pilots' licenses. A federal judge ruled that engineers' qualifications are a "management prerogative" and that FEIA could not legally strike. The strikers, however, did not return to work, stating that wages, working conditions and fringe benefits also were involved.

American was trying to prevent a pilots' strike by obtaining an injunction. Jet pay and crew complement are the issues. Pan American faced similar issues.

Hoffa's Teamsters were not only eyeing ways to organize more airport and airfreight workers—making possible complete airport shutdowns—but had promised "moral and financial help" to FEIA. Teamster drivers are pledged not to deliver avgas across FEIA picket lines, already have refused to deliver kerosene, in one instance, to EAL for Electras at Newark.

Meanwhile, the airlines continued to seek means to correct what they called "imbalance" at the bargaining table.

Some industry officials reportedly have now proposed a plan of dividing the airlines into groups with similar interests, which would discuss labor problems and plan courses of action. Presidents would attend meetings, instead of delegating authority to others. An airline would not need the group's approval to settle a contract, but its president would inform the other members in advance of his intentions.

On Other Fronts-

- Lake Central—settled a 10-day walkout of stewardesses.
- Piedmont, Bonanza and West Coast—awaited results of arbitration to settle pilot dispute over F-27 fiying.
- United—was in mediation with flight engineers. Mechanics contract expired, but no immediate trouble reported.

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Spur for Caravelle

Rolls-Royce RB-141 makes French jet more desirable

A proposal by Rolls-Royce, Ltd. of a new 16,000-pound thrust by-pass engine as its answer to "aft-fan" and "front-fan" developments in the U.S. reportedly is spurring new interest in Sud Aviation's twin-jet Caravelle.

Some observers go so far as to predict it will cinch for certain the onagain-off-again decision on the part of Republic Aviation Corp. to build the French jet transport under license in the U.S.

The reason: some U.S. airlines have long considered the Caravelle as an ideal aircraft in its field and the performance improvements growing out of the mating with the new RB-141 have heightened their interest. At least one airline is understood to have a committee studying the aircraft at this time.

This reportedly has spurred new interest by Republic in the Caravelle and is expected to lead to a decision on production go-ahead in the relatively near future. This would eliminate probably the biggest obstacles to Caravelle sales in the U.S.—(1) the inability of Sud Aviation to produce in quantity for early delivery and (2) the airlines' general preference to buy a U.S.-built transport.

Republic's renewed attention to the Caravelle also is believed to stem from a decision to hold off on its Rainbow turboprop transport due to a waning market interest in such a model. Although details on the new Rolls-Royce engine have not been released, it is understood to be a straight by-pass of the Conway type. However, Rolls reportedly has been able to improve upon Conway efficiency and to propose the RB-141 at a thrust higher than the Conway while maintaining the same diameter.

New Blast at CAB

Banker says fare policies threaten national security

The Civil Aeronautics Board, which has yet to win a vote of confidence from any source in its fare regulation policies, finds itself on the receiving end of a new blast from financial circles.

Donald N. McDonnell, chairman of the Aviation Securities Committee, Investment Bankers Assn. of America, told an IBA meeting in Miami that the government is unwittingly penalizing the aviation industry and poses a threat to national security in the face of rapid gains in Russian aviation.

In the commercial transport field, McDonnell said CAB policy has been unduly restrictive and is a threat to airline growth. He urged White House to follow up on the Cherington Report by appointing an outstanding individual to review the Civil Aeronautics Act and CAB procedures.

More specifically, he urged CAB to discard its narrow and inapplicable public utility ratemaking concepts in favor of an investment market, costof-capital approach that would allow an adequate return to capital for the risks and development needs of the industry.

McDonnell suggested the Board undertake an overall review of competition in the light of the new economies of the jet age.

He called for an end to Board practice of encroaching upon and ultimately dominating airline managerial practices, inhibiting their development and threatening to substitute political decree for economic freedom.

Ham-Stan Wins NAA Nod For B-70, F-108 Systems

Hamilton Standard, a name virtually synonymous with aircraft propellers for years, reaped its biggest diversification reward recently in a contract from North American Aviation to develop airconditioning and pressurization systems for both the B-70 bomber and the F-108 interceptor.

The contracts reportedly are the largest for such systems ever to go to a single firm. Although exact dollar amount was not disclosed, it is said to have involved several millions of dollars.

In winning the award for the two projects, the United Aircraft Corp. division faces the task of handling temperatures as high as 600 F. generated by the Mach 3 speeds of the two aircraft.

Hamilton Standard officials said they expect to allot about 50% of the work to subcontractors and suppliers.

Arnold's Leasing Firm Makes Deal on First of 25 DC-7s

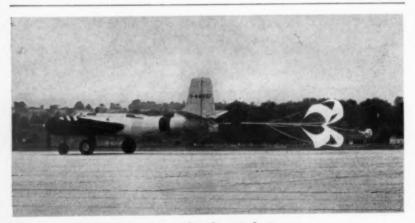
General Aircraft & Leasing Corp. opened for business in the Barr Building, Washington, D.C. on December 1 with Milton W. Arnold at the helm and a lease for five Douglas DC-7s on its books as "business transacted."

Arnold told AMERICAN AVIATION that five of the 25 DC-7s being purchased from American Airlines have been leased to another airline but declined to disclose either the carrier of the terms. First of the DC-7s are due to be turned over by AA on January 3.

He also indicated another deal involving eight DC-7s was being negotiated, but that financing problems remained to be solved.

The former Air Transport Assn. official held no reins on what areas the new firm might explore—even such possibilities as buying new aircraft for leasing or modifying present piston types to turboprop power.

He indicated, however, that these undertakings are not the first order of



Rotating Chute Has Low Shock, High Drag

Pioneer Parachute Co., Manchester, Conn., will soon produce a new rotating parachute for paratroop, cargo drop, missile recovery, and ground braking operations. It is said to have higher drag efficiency, lower opening shock, and excellent inherent stability compared with conventional types. Rotation of cloth blades creates vortex ring of air around tips, increasing total drag area and, in effect, enlarging size. Rate of rotation is one revolution each two seconds.

Officially known as the Vortex Ring parachute, it is currently undergoing evaluation and service tests conducted by all branches of the Armed Forces, as well as two airframe manufacturers.

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business—that there is a market immediately at hand for turbocompoundpowered DC-7s modified, for example, as combination high density tourist and airfreight aircraft.

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\$27,500,000 Lease GE will get \$196,500 per engine in deal with AA

The engine lease deal between American Airlines and General Electric on aft-fan engines for the Convair 600 carries a base rental price of \$196,500 per engine or \$27,500,000 for the 140 engines involved in the lease.

These details were made known by American recently in a bid to CAB for approval of the agreement with Jet Engine Leasing Corp., a wholly-owned General Electric subsidiary.

Of the 140 engines, 126 are being leased from Jelco under a contract signed by AA on July 1 and 14 others are to be purchased from Convair. AA will receive 100 of the engines installed in its 25 Convair 600s, whereas the other 40 represent spares to support its operation.

Delivery dates for the GE aft-fans will extend from January 1961 through

Under the terms of the lease submitted to CAB, AA may elect to finance the outright purchase of the engines by borrowing from lending agencies and using J. P. Morgan & Co. as an agent.

The carrier holds an option to purchase that must be exercised by December 31, 1968, the expiration date of the contract. If it exercises its option, AA must pay the unpaid balance on each engine or 10% of the \$196,500 rental price, whichever is greater.

Used Plane Exchange

"Curb market" for used aircraft starts operation

A "curb market" for used aircraft has been set up in New York by a group headed by Robert I. Helliesen, former American Airlines marketing and economics specialist. Called "Aircraft Exchange, Inc.," the group is soliciting membership from individuals, governments and business groups interested in the used aircraft market.

Operations will start in New York and London January 6. Basic idea is to accumulate aircraft bids and ask quotations from members, who may be airlines, manufacturers, business firms, investors, dealers, government agencies and individuals.

The exchange will take quotations until 3 p.m. each Tuesday. Where a bid-and-asked quotation on a particular aircraft seems to be reasonably close, the exchange will notify both parties by Wednesday evening. On Thursday, the exchange will publish a weekly market letter giving quotations on all transport aircraft listed with a 20,000 lb. gross weight and over.

Membership fees range from \$30 per year for regular or service members to \$10 per year for associate members who will be sent market reports on an every-other-week basis. The exchange will also charge a commission ranging from 1% to 3% on the sale of aircraft listed.

In addition to Helliesen, officers of Aircraft Exchange, Inc. are Charles Biondi, vice president and director; Dr. H. B. Dorau, treasurer; Alfred C. Turine, secretary; Ralph V. Hudnut, Edward A. Merkly and Morton Wolovski, board members.

Biondi was vice president and gen-

eral manager-traffic and sales for Philippine Air Lines and was also an official of the International Air Transport Association.

CAA-FAA Merger

Indianapolis R&D activities will be transferred

FAA Administrator E. R. Quesada has issued orders that will consolidate the research and development activities of CAA at Indianapolis with those of new FAA R&D groups in Atlantic City and Washington, D.C.

A target date of June 30, 1959 has been set for the merger, to agree with the end of the fiscal year and to provide an opportune period for personnel involved in the shift.

Essentially, the move will entail transfer of personnel now doing research, simulation and test work at Indianapolis to FAA's National Aviation Facilities Experimental Center at Atlantic City. Those engaged in administrative R&D work will become part of FAA's new Bureau of Research and Development (formerly Airways Modernization Board).

Although the shift will affect virtually all activities now based at the technical development center, it does not mean that Quesada plans to close the facility at Indianapolis. He told AMERICAN AVIATION that other plans are being programmed for the facility and that it will remain in operation.

Although Quesada declined to state the nature of the anticipated use of the Indianapolis facility, according to one unconfirmed report, it is being considered as an international center for all FAA flight inspection of civil and military navigation aids.





Boeing Airplane Co. Photo

Douglas Flies J75-Powered DC-8; Boeing Rolls Out Intercontinental

Dauglas Aircraft Co. made good its bid to be first in the air with a Pratt & Whitney J75-powered jet transport on November 29 when DC-8 No. 2 completed its maiden flight from Long Beach Municipal Airport.

Alter a short shakedown flight, Douglas test pilot A. G. Heimerdinger landed the aircraft at Edwards AFB, headquarters for DC-8 proving flights.

Not far behind Douglas, a matter of days or a few weeks, Boeing Airplane Co. rolled out its first 707-320 also powered by the commercial equivalent (JT4) of the 15,000-lb. thrust military J75.

Coincident with the flight of DC-8 No. 2, Douglas flight test director R. L. Hoskinson said that DC-8 No. 1 had logged 131 flight hours. E. F. Burton, vice president-engineering for transports, said testing will be stepped up greatly this month as two more DC-8s enter the certification program.

DECEMBER 15, 1958

A-Plane Probe Due

Weapons system concept to be under scrutiny when the Congress looks at ANP lag

All the signs point to a major inquiry on why and how the United States lost its lead to Soviet Russia in the battle to produce a nuclear powered aircraft.

Basic to the whole issue is the role that the present weapon system concept plays in the development delay. Recent research studies indicate that the weapon system concept as presently applied in research programs has resulted in the failure to do sufficient work in technical development. The most important and definitive study in this area was the report of the Stever Committee which investigated Air Force research and development programs at the request of Air Force Chief General Thomas White.

Congress will want to know why the Navy was able to develop Nautilus within a relatively short period of time and why the same system was not applied to the development of the nuclear propelled aircraft despite the fact that Lt. General Donald L. Putt (USAF, ret.) explained over and over again the importance of the aircraft for both reconnaissance and prestige.

Some of the answers which will be provided are bound to be "disturbing" but advocates of a new deal for research and development are hopeful that the evidence which will pile up will make it impossible for it ever to happen again.

The answers to the present sorry story, according to informed industrial and Pentagon sources, seem to be:

• Former Defense Secretary Charles E. Wilson didn't believe that the nuclear powered aircraft would provide good enough performance to warrant giving it an important priority.

• Important studies by the Navy and the Atomic Energy Commission were held up by the refusal of the Bureau of the Budget to release funds made available by the Congress.

• The practice of writing a requirement (Mach 3) substantially beyond the state of the art made it virtually impossible to get a hardware program moving.

 Navy and AF battles over whether the aircraft should be turboprop or turbojet and the enthusiasm of the Navy for the SeaMaster were contributing factors in the delay.

 Virtually no money has been made available except on a crash basis for improving materials needed to meet not only the nuclear aircraft requirement but other advance requirements for aircraft, missiles and electronic equipment. This has not been at Congressional level but rather in trying period of maneuvering both before the budget is submitted within levels fixed by the Administration and afterwards during the so-called apportionment process. The general attitude has been "this can wait."

What Congress can do about it aside from giving the whole matter a public airing remains to be seen.

Project All-Jet May End Propeller-Plane Training

Project "All-Jet" was launched November 20 by Air Training Command at Bainbridge AFB, Georgia. The program will take 38 student pilots through primary flight training with no propeller airplane time.

An experiment, "All Jet" will determine whether or not propeller-driven trainers can be phased out of Air Force training curriculum. Prior to this program, all students received 30 hours introduction in Beechcraft T-34 reciprocating aircraft before progressing to the Cessna T-37 for 100 hours flight time. Students participating in the test will get 115 hours flying, all in the T-37. Academic ground school in the normal program totals 223 hours scheduled over 108 training days. The test group will get 213 academic hours over a 98 day period.

It is expected that a student will require 10 to 12 hours to solo the T-37. Average time in the T-34 is 10½ hrs., with an additional nine hours to solo the T-37. At the end of the test a comparative cost evaluation will be made.

Bainbridge AFB is operated under contract to the Air Training Command by Southern Airways Co.

AF Contracts to Develop Automatic Landing System

The development of a new version of Bell Aircraft Corp.'s automatic landing system has been contracted for by the U.S. Air Force. The system will be based on the original ground equipment developed by Bell for the Navy and later ordered by the Air Force, but the new order differs in the method of tracking approaching aircraft and relaying commands during automatic landings.

Bell's original system uses a combination of radar and radio in tracking aircraft, but the newer development will be dependent on a signal broadcast by the approaching plane. It will also have the capability of transmitting information on a radar beam instead of necessitating a separate radio link between the airplane and surface equipment.

Aircraft Sales Dip

Three government agencies noting general decline

A general downward trend in both sales and backlogs of aircraft manufacturers has been noted in separate reports issued by the Bureau of the Census, the Civil Aeronautics Administration and the Department of Defense.

The Defense Department was optimistic in its report, however, and forecasts that the rise in government spending will continue throughout the balance "if not all" of the current fiscal year. This is expected to aid those manfacturers who have seen their business slip away and their inventories greatly depleted as a result of the summer economy wave of 1957 and a general shift in some phases of the military from aircraft to missiles procurement.

Bureau of the Census and CAA, reporting on the manufacturers of complete aircraft, engines and propellers, revealed that the total backlog was down 4% as of June 30 and a drop of 9% from the end of the third quarter of 1957. The report states that 66% of the aircraft backlog and 75% of the engine backlog was accounted for by U. S. military orders.

Heli-Coil, Topp Subsidiary, Is Purchased By N. Y. Group

Heli-Coil Corp., a wholly owned subsidiary of Topp Industries Inc., has been purchased by a New York City group headed by W. C. Langley for a reported \$3.5 million. Topp purchased Heli-Coil in 1956 for, what was reported at the time, a price of \$2.3 million.

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Officials at Topp said that proceeds from the sale of the Danbury, Conn. manufacturing division will be used for expansion of its industrial controls division and to finance expanding production of the U.S. Semi-Conductor Corp., Phoenix, Arizona, which Topp is now negotiating to purchase.

Victory and Curtis Named For Top Aviation Trophy

Dr. John F. Victory, assistant to the administrator of the National Aeronautics and Space Administration, and Edward P. Curtis, former special assistant to the President, have been chosen to receive two of aviation's outstanding awards for 1958.

Curtis, a World War I Ace and re-

AMERICAN AVIATION

cipient of many honors in aviation, has been selected to receive the Collier Trophy Award for 1957 for his "Aviation Facilities Planning" report, which was prepared for President Dwight D. Eisenhower. The trophy is presented annually by the National Aeronautics Association and is sponsored by Look magazine. It is in recognition of what NAA considers "the greatest achievement in aviation in America during the preceding year." President Eisenhower will make the presentation at the White House tomorrow, December 16.

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Dr. Victory was selected to receive the Wright Brothers Memorial Trophy, awarded each year for "significant public service of enduring value to aviation in the United States by the Aero Club of Washington, D.C. He has been closely associated with aviation since he joined the National Advisory Committee for Aeronautics, now the National Aeronautics and Space Administration, in 1915. Dr. Victory designed the award in 1948 that he will now receive at the annual Wright Day dinner in Washington on December 17.

. . . News Briefs

- •Three West Coast manufacturers of aircraft components and equipment with sales in the neighborhood of \$20 million annually, Vard, Inc., Royal Industries, Inc., and Arrowsmith, Inc., are negotiating a merger.
- National Aeronautics & Space Administration is working hard at the problem of reducing landing approach speeds. Conclusion so far is that boundary layer control by itself is not enough. Work will go on with both flight and ground simulators with power-off landings in configurations with very low lift-drag ratios considered an important problem. Uses of automatic throttle control in approaches and controllable thrust reverser in flight and landing are under study.
- A helicopter muffler that reduces outside noise to street noise level has been developed and will be marketed by Northrop Aircraft's Northrop division. The muffler has CAA approval and may be purchased in kit form or installed at the company's Hawthorne, Calif., facility. Installation takes less than three hours.
- Federal Aviation Agency has awarded a \$261,000 contract to Bendix Radio Division for development of anticollision equipment for aircraft. The contract is for experimental evaluation of a simple altitude-range collision avoidance system using ground reflected method of range measurement. Contract extends to May 17, 1960.

DECEMBER 15, 1958

DEFENSE ANGLES-

By Betty Oswald

You may soon hear spot radio ads and see in the classified advertising columns of the daily papers the following: "Wanted Director Research, Engineering, for duty at the Pentagon. Qualified man must be engineer or scientist with proven administrative ability. Must be rich enough to give up corporate salary, bonuses, pension plans and stocks in all companies who do business with or would like to do business with the Defense Department, the Army, Navy, Air Force or any of their related agencies. Other necessary qualities include: Proven record as a diplomat in dealings with competing companies, the Congress and the services; imagination sufficient to be able to sort out the new from the old, the legitimate from the window dressing; and courage sufficient to lay a reputation on the line to do a job that is badly needed." Reason for the ad will be Mr. McElroy's continuing failure to find a research director.

- One brand of R&D—Biggest single question for the Congress. Is competition all bad? As Dr. A. H. Flax of Cornell Aeronautical Laboratory put it recently: "In an age when we can afford to have a choice of two dozen makes of automobiles and many dozen brands of soap it is rather strange that some of the firmest adherents of competition believe that there should be only one brand of research and development."
- Under the Xmas tree—Like children the world over, military aircraft manufacturers have written their letters to Santa Claus. Here's what they'd like to find in their stockings after the New Year.

For Boeing's Bill Allen, a substantial slice of the B-70 structure from North American's Dutch Kindelberger.

For Lockheed's Bob Gross, a spanking new electronics division, which could include Hughes.

For Chance Vought's C. J. Mc-Carthy and J. S. McDonnell, Mc-Donnell Aircraft's prexy, a chance that the Navy will be allowed to buy both the F8U-3 and the F4H, in at least limited quantities.

For Convair's A. C. Esenwein, a magic formula for cutting the costs of the B-58 Hustler and some firm assurance on the future of the nuclear powered aircraft. Lockheed's General Manager at Marietta A. C. Koethien also wants in on the nuclear plane.

For Pratt & Whitney's General Manager L. C. Mallet, some assurance of a place in the sun for the company's brand new baby JT-12 engine and a new chance at the nuclear powered aircraft engine.

For McDonnell Aircraft and Lockheed, at least a split decision in the UCX competition with the AF authorized to buy a few Model 119s from McDonnell and JetStars from Lockheed.

For Fairchild's Dick Boutelle, a military order for F-27s—for air evacuation or to take the place of some tired DC-3s.

For Don Douglas, a new look at the C-132 and a chance at the proposed new early warning aircraft.

For North American's Kindelberger, a chance that the X-15 will be the first manned space ship to orbit the earth as well as a real green light for the F-108 and the B-70.

For Northrop's Whitley Collins, a big order for the N-156F counterair fighter and a fat order for more T-38 advanced supersonic trainers—with the engines needed to push the delivery schedules.

For Cessna's Dwane Wallace, an AF decision to abandon primary training in propeller driven aircraft which could mean a fat order for new T-37s.

For North American's Columbus Division, a firm order for the A3J Viking.

For General Electric, a happy solution to the problems of chemical fuels to permit the company to speed development of the J-93. A hardware order for the nuclear powered engine would be a nice bonus.

For Westinghouse and Curtiss-Wright, more military engine work in the new year with a production order for each of them at the end of the road.

For Republic Aviation, a firm future for the F-105.

For Bell, Vertol and Sikorsky, Kaman, Hiller and Doman, a place in the sun for helicopters and a place for them in the future.

And for all of the manufacturers a happy solution to the problems of renegotiation, cost allowances and funding in which they are sometimes embroiled at the Pentagon.

Special Theme Supplement: Aircraft/Engine Maintenance & Overhaul



New \$2 million jet hangar brings a "jet age" look to National Airlines' maintenance facilities. With 112-ft. wings on each side, it will house six Douglas DC-8s.

Turbines Are Creating Big Problems

Airline maintenance and overhaul forces, for the most part a "taken for granted" aspect of piston transport operations, are facing the acid test in upcoming turbine operations.

But the test is not simply one of good or bad technical management. Rather it is one with stronger overtones of economics.

Such decisions as whether to lease or buy jet engines, to build new facilities or contract for overhaul, are major gambles involving millions of dollars. The right guesses, and these are still to be proven at some point in the future, can save millions at a time when carriers are hard pressed to finance their initial jet purchases.

But wrong decisions, made even at this relatively early stage of jet maintenance and overhaul planning, could create an economic burden from which the carrier may be hard pressed to recover.

Right or wrong, the carriers are calling their shots and the targets they are choosing vary quite widely.

American Airlines, a perennial leader in finding new answers to big problems, has come up with one of the most complex engine purchase and lease deals involving the engines for its Boeing 707, Lockheed Electra and Convair 880 fleets.

AA will buy and overhaul some P&W J57s for its 707s, will lease Allison 501s and GE CJ-805s for its Electras and 880s and will lease some P&W engines for its later Boeings.

Allison and GE will overhaul engines for American, but each of the agreements has an "option to buy" clause when the depreciated value of the jets makes it advisable for AA to take over.

Eastern, for example, is purchasing its Allisons, has

negotiated a maintenance and overhaul cost agreement whereby it is guaranteed a maximum maintenance and overhaul cost above which it is reimbursed by Allison. But if costs fall below this figure, Eastern has to credit Allison.

Braniff Airways, which last month unveiled its new \$6.5-million maintenance and operations base, is buying both its Allisons for the Electra and P&W JT4s for its 707s. It will engage Allison to overhaul the turboprops, but all indications are it will contract outside, presumably with Southwest Airmotive Corp., for overhaul of the big Pratt & Whitney jets.

The philosophy at Braniff is to steer clear of the heavy investment in jet engine overhaul and test facilities for these engines until some marked advances are forthcoming in the development of universal shop equipment to do the job for both.

R. V. Carleton, v.p. operations, estimates it would call for \$1 million in equipment to overhaul the JT4 and another \$1 million for test facilities. The Allison engine would add about \$850,000 more in specialized overhaul equipment not usable on the JT4s and almost that amount again for testing, bringing Braniff's required investment somewhere between \$3 million and \$4 million.

By avoiding this healthy bill on top of peak piston engine overhaul operations, Braniff officials feel they will be in a much more advantageous position during the next few years to take another look at jet overhaul as piston work phases out and less costly overhaul equipment appears on the scene. And they won't face the problems of building up a peak work force only to have to pare back again to present levels when the piston engine moves out of the shop.

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contractor. But the economics of jet engine buying and leasing is but one of the tests facing airline managements.

The airline overhaul base that normally housed a trio of DC-6s or DC-7s and perhaps a like number of Convairs will find itself with upwards of \$20 million in aircraft shop-bound all the time when the designations change to Boeing 707s and Lockheed Electras.

Whether it be the right or wrong decisions in procurement, good or bad planning in operation, or perhaps the problem of coping with carelessness, there's little question but that airline maintenance is facing the acid test with turbines.

Regardless of how it fares, there's one thing for certain: management no longer can afford to take its maintenance personnel or practices for granted—the stakes are just too high.

-Airline Maintenance & Overhaul Facilities

Though much publicity has been

Seeking a measure, AMERICAN AVIATION polled 41 U.S. air carriers.

given to new jet and turboprop airliners, little has been said about the investment to keep them flying.

Allegheny Airlines, Washington, D.C.* Alaska Airlines, Seattle, Wash.* Alaska Coastal, Juneau, Alaska.*

Allegheny Airlines, Washington, D.C.*
Alaska Airlines, Seattle, Wash.*
Alaska Coastal, Juneau, Alaska.*
American Airlines, Tulsa, Okla., has 300,000 sq. ff. for aircraft, 180,000 sq. ff. engine overhaul space. Total investment \$10 million (approx.) Overhauls CV240, DC-6, DC-6A, B, DC-7 aircraft, CAIS R-2800, C816 R-2800, TC 18
R-350 engines. Has 2,820 maintenance, 139 engineering employes. Payroll, \$23.5 million. Has \$20.1 million in spare parts and material. Overhauls 15 CAIS, 48 C816, 57 TC 18 engines per month, 3.5 CV 240, 2.2 DC-6, 2.1 - 48, 1-6A, 42 DC-7 aircraft per month. Plans to finish \$20 million, 350,000 sq. ff. left base by Mar. 59, Turbo props (S01-D13) will be overhauled by Allison. Expect to overhaul 33 jet engines, per month. Will stock 44% spares.
Bonanza Airlines, Las Vegas, Nev.*
Braniff Airways, Dallas, Tex., has a new \$6.5 million overhaul facility with 400,000 sq. ff. working area. 992 maintenance and 38 engineering people are employed on \$6.5-million payroll. \$4.5 million goes each year for spares to overhaul 3 DC-3s, 9 CV 340/440, 2 DC-6, and 2 DC-7C aircraft. 8 R3350, 19 R2800, and 5 R1830 engines monthly are also included. 5 jet and 12 turboprop engines are expected to be overhauled monthly, with 1 jet and 2 turboprop aircraft. S0% jet and 40% turboprop spares to be kept. Silencers are planned. Capital Airlines, Washington, D.C., has \$2.25 million in overhaul facilities. Has approx. 1,700 maintenance and engineering personnel with \$7.2 million payroll. Buys \$6 million in overhaul facilities. Has approx. 1,700 maintenance and engineering personnel with \$7.2 million payroll. Buys \$6 million in overhaul so the Dart Silencers are planned. Capital Airlines, H. Worth, Tex.*
Continental Airlines, Denver, Colo., has 17,500 cant overhauls and the spares. Engine overhauls overhaul to So. Overhauls its own DC-3, 240,440, Viscount 812, DC-78 aircraft. Has 42 maintenance, 11 engineering employes. Central Airlines, Anchorage, Alaska.*
Delta Air Lines, Alanta, Ga., devotes 170,000 central Airlines, F

stern Air Lines, Miami, Fla.*

lis Air Lines, Ketchikan, Alaska, contracts gine overhaul to Wesco Air Service. Overulls Grumman G 21 A and Cessna 180 airaft at rate of one per month. Employs 25 aintenance and 5 engineering people with million payroll and \$.05 million in materials. ying Tiger, Burbank, Calif.*

ontier Airlines, Denver, Colo., has 20,000 ... ft, of aircraft and 5,000 sq. ft, of engine erhaul area. Has invested \$125,000 in facili-

The survey shows that productive personnel of nearly 20,000 people are employed in airline maintenance alone. They represent a payroll of \$80 million annually, and use at least \$100 million worth of facilities.

least \$100 million worth of facilities.

ties. Overhauls 21 DC-3 aircraft and II R1830-92 engines per month. Mechanics based
at Albuqueraue, Billings, Cortez, N.M.; Bismark, N.D.; Casper, Wyo.; Phoenix, Flagstaft,
Grand Junction, Colo.; Salt Lake City.
Hawaiian Airlines, Honolulu, T.H., has 19,
200 sq. ft. for aircraft and 7,176 sq. ft. for
engine overhaul. Has 140 maintenance and 2
engineering employes. Overhauls 1½ R-1830,
1½ R-2800-CB3, 16, 17 engines per month for
its DC-3 and CV 340 aircraft,
Lake Central Airlines, Indianapolis, Ind., uses
24,186 sq. ft. for aircraft overhaul with investment of \$31,000. Confract's engine overhaul to Dallas Airmotive for 3.2 R-1830-900
engines per month. Has \$295,000 payroll and
\$100,000 in spares per yr. Will expand present
base an additional 9,000 sq. ft.
L.A. Airways, Los Angeles, Calif.
Mohawk Airlines, Utica, N.Y., contracts engine
overhaul to Dallas Airmotive. Has \$3 million
invested in 36,000 sq. ft. aircraft and 15,000
sq. ft. engine shop area. Overhauls ½ CV
240 and ½ DC-3 each month and overhauls
86 maintenance and 5 engineering employees
with \$375,000 payroll. Buys \$1.2 million in
spares.
Mational Airlines, Miami, Fla., has invested

86 maintenance and 5 engineering employes with \$375,000 payroll. Buys \$1.2 million in spares.

National Airlines, Miami, Fla., has invested \$5.3 million in maintenance facilities, with 141,000 sq. ft. for engine overhaul. Overhauls 8 Wright G202A, II R.3350, II.2 R.2800 engines permonth in addition to L-18, CV 340,440, DC-6,68, DC-7,778, Lockheed 1049H aircraft. Has 1,025 maintenance and 20 engineering employes on \$4.9 million payroll. Has \$1.9 million per yr. in spares. Other maintenance people based in N.Y. (Idlewild), Boston, Newark, Philadelphia, Washington, Norfolk, Tampa, New Orleans, Houston, and Jacksonville.

N.Y. Airways, La Guardia Field, N.Y.

Northeast Airlines, Boston, Mass., devotes 42,000 sq. ft. to engine overhaul. Overhauls 5½ R.1839-23, 8½ R.2800-CB 16, 2½, R.2800-CB3, engines per month. 7 RR Dart 510 engines will be contracted for overhaul by Capital Airlines each month. NE overhauls DC-3A, DC-6B, CV 240, and Viscount 745 aircraft progressively. Has 474 maintenance and II engineering employes. Other mechanics at La Guardia, Miami, Tampa, Washington, Philadelphia, New Bedford, Worcester, Presque sle. Plans are for a \$3.5 million base to overhaul about 8½ furboprop engines and 1½ sicraft per month. 25% spares will be kept. Northern Consolidated, Anchorage, Alaska.

Northwest Airlines, St. Paul, Minn, has a total overhaul area of 450,000 sq. ft. representing 30 certain progressively and the proper service of the contracted engineering employes are based at 5t. Paul, Minneapolis, Seattle, and Tokyo. 7.% per month, 125% spares will be kept. Northern Consolidated, Anchorage, Alaska.

Northwest Airlines, St. Paul, Minn, has a total overhaul area of 450,000 sq. ft. representing 30 certain progressively and the proper proper service of the proper proper service of the proper proper service of the proper se

Pacific Air Lines, San Francisco, Calif.*
Pacific Northern Airlines, Seattle, Wash., leases

In the next 18 to 24 months, the airlines will spend another \$45 million on overhaul facilities for jets and turboprops.

Here, by carrier, is a synopsis of airline activities:

its facilities. Engine overhaul is contracted to Pacific Airmotive (PWA R-2000), Wesco (PWA R-3500), Wesco (PWA R-3500 BD-1). Employs 130 maintenance and 3 engineering persons on a \$900,000 payroll. \$1.3 million in spares is procured annually. Overhauls one L-749, .25 DC-4, and .5 DC-3

R-350 BD-I). Employs 130 maintenance and 3 engineering persons on a \$900,000 payroll. \$1.3 million in spares is procured annually. Overhauls one L-749, 25 DC-4, and .5 DC-3 per year.

Pan American Grace, overhaul done at Miami by PAA (Latin American Division).

Pan American World Airways (Lat. Amer. Div.) Miami, Fla., has \$28 million invested in its 408,000 sq. ft. aircraft and 1.28 million sq. ft. engine overhaul bases. 3,066 maintenance and 169 engineering people are employed. Payroll is \$17 million, and parts procurement is \$16 million per year. Current overhaul rate for engines is 15 R-2000, 34 R-2800, 47 R-3350-DA/EA per month. Aircraft overhaul is 1 DC-4, 5 DC-6A/68, 3 DC-7C per month. Base will handle lets in Latin American Division. Piedmont Aviation, Winston-Salem, N.C., has invested \$1.5 million in overhaul and maintenance. Aircraft overhaul space is \$0,000 sq. ft. with additional 7,500 sq. ft. for engines. 15 R-1830, 1 R-985, and 15 small engines are overhauled per month. Aircraft overhauled are DC-3s and F-27s. Has 225 maintenance and 2 engineering employes, on \$460,000 payroll. \$560,000 is procured annually in parts. 12,000 sq. ft., \$400,000 base will be finished January 1, 1960. Dart engine overhaul will be contracted to Capital Airlines in January, 1959, \$200,000 in test equipment will go to the new base. Reeve Aleutian Airways, Anchorage, Alaska, has \$260,000 in overhaul facilities with 7,792 sq. ft. of aircraft and 5,481 sq. ft. engine overhaul space, 29 maintenance people are on a \$276,000 payroll. Spares procurement amounts to \$33,000 per year. Many small aircraft up to DC-3 size are overhauled.

Resort Airlines, Oakland, Calif., contracts all overhaul to Transocean Air Lines.

Silick Airways, Burbank, Calif., contracts all overhaul to Transocean Airmains, Alanna, Fars procurement is \$120,000. Sq. ft. engine overhaul space. 29 maintenance and 2 engineering employes. \$300,000 in spares is bought annually. Dallas Airmative overhauls 4 R-1830-900s per month. Trans Vard Airlines, New York, N.Y.*



After successful flight tests, Wright has given unlimited flight test approval for the new AC-275-D Aircraft Spark Plugs in the 3350 Turbo Compound Engines! This is an unqualified endorsement for AC's exclusive features shown above!

As previously announced, P&W approved the AC-275-D for

the rear position front row on its 2800s in combination with the AC-271 for all other positions. Now, fleets operating both these engines can service them by stocking only two types of AC Spark Plugs!

AC SPARK PLUG A THE ELECTRONICS DIVISION OF GENERAL MOTORS

AC AWARDED FIRST C.A.A. PMA (PARTS MANUFACTURER APPROVAL) FOR AIRCRAFT SPARK PLUCS!

DISTRIBUTED BY: Alawark Corporation: Millville, New Jersey; Miami Springs, Florida; Newark, New Jersey; Atlanta, Georgia; Alexandria, Virginia; Cleveland, Ohio. ith Airmotive Corporation: Burbank, California; Seattle, Washington; Oakland, California; Kansas City, Kansas; Denver, Colorado; Chicago, Illinois; Linden, New Jersey. Southwest Airmetive Company; Dollos, Texas; Abuston, Texas; St. Louis, Missouri; Kansas City, Kansas; Denver, Colorado.

Stendard Aere Engine Ltd.: Winnipeg, Manitoba; Vancouver, B.C.; Edmonton, Alberta.

18, Inc.: Chicago, Illinais; Minneapolis, Minnesota; Teterboro. New Jersey; East Boston, Massachusetts; Alexandria, Virginia; Richmond, Virginia; Miami, Florida.

It's Diversify or Disappear

The major ingredient in the formula for success of engine and aircraft contract overhaul operations in the U.S. appears to be diversification.

This can be seen immediately from the response to an AMERICAN AVIATION survey of private mainten-

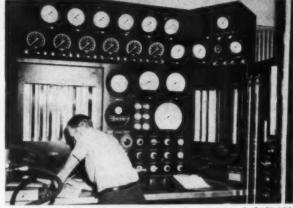
ance and overhaul companies.

Those heavily involved with military contracts are facing the problems familiar to this "feast or famine" type of existence. For example, Pacific Airmotive aircraft overhaul operations suffered a substantial setback due to curtailment of IRAN work which resulted in virtual shutdown of the company's Chino, Calif. facility.

Similarly, military cutbacks hit Southern California Aircraft. Spartan Aircraft shows a drop in 1958 business as a result of its close-out of an Army contract to perform maintenance at Ft. Sill. Fortunately, all these companies figure in commercial overhaul operations, so there's no reason to suppose that the effects of military contract overhaul policies will be lasting.

Southwest Airmotive, for example, has gained experience in overhaul of some 6,000 Allison J33 turbojets, and this leads naturally to expansion into the com-

mercial jet overhaul field.



FUEL CONTROL TEST STAND is only a part of \$150,000 invested by Airwork for jet accessory overhaul equipment.

Biggest operation in the contract overhaul field is that of Lockheed Aircraft Service of Ontario, Calif. This company is experiencing cuts in its military work. But, because it holds maintenance and overhaul contracts with a dozen airlines, contracts to give technical assistance in setting up T-33 and P2V production at Kawasaki Aircraft in Japan, etc., it doesn't feel the blow as badly as some others.

Another company expanding into diversified activities is Airwork Corp. of Millville, N.J., which recently invested more than \$150,000 in test stands for a jet accessory overhaul facility at Miami. It already holds a contract with Allison to overhaul 501-D13 turbo-

prop engine accessories.

CONTRACT OVERHAUL & MAINTENANCE FACILITIES

Progressive maintenance and overhaul companies that have prepared for the commercial jet era will be

ENGINE OVERHAUL

eNGINE OVERHAUL

Aerodex, Inc., P. O. Box 123, International Airport Branch, Miami 48, Fla. In business since 1951. Total engines overhauled, 16,483, Types overhauled: P&V R. P65, R. 1340, R. 1830, R. 2000, R. 2800; Wright R. 1300, R. 1820, R. 2600. Elapsed overhaul time, 15-45 days, 1957 gross, \$12 million; est. 1958 gross, \$1 million, Annual outlay for parts, equip., etc., \$3,500,000. Inventory, \$1 million, 650 shop employes. Payroll \$3,500,000/year.

500,000/year.
Airwark Corp., Municipal Airport, Millville, N.J., In business since 1946. Total engines overhauled, 6,158. Types overhauled: Continental E-185, E-255, O-470 series; Lycoming GO-435, GO-480; P&W R-985, R-1340, R-1830 all series, R-2000, R-2000-CA and -CB; Wright R-1820. Elapsed overhaul time, 30-45 days. 1957 gross, \$3,869,761; sst. 1958 gross, \$4,500,000. Annual outlay for parts, equip., etc., not avail. Inventory \$1,175,000, 325 shop employes. Payroll, \$1,172,770/-year.

Pacific Airmotive Corp., 2940 N. Hollywood Vay, Burbank, Calif. In business since 1928, Total engines overhauled, 15,370 (since 1935), Types overhauled: P&W 442, J48, J57, J75, R*98, R*1340, R*1830, R*2000, R*2800, R*4360, T314; Westinghouse J40, J46; Wright R*2600, Elapsed overhaul time, 30 days except J57 21 days, 1975 aross, \$4,046,414; est. 1958 gross \$3,376,500. Annual outlay for parts, equip., etc., \$2,800,000 (1957), Inventory \$875,000 (1957), Av. 150 shop imployes, Payroll \$1,250,459 (1957).

employes. Payroll \$1,250,459 (1957).
Spartam Aircraft Co., Aviation Service Div.,
Municipal Airport, Tulsa, Okla. In business
ince 1928. Total engines overhauled, 17,191.
Vipes overhauled: Continental A-65; P&W R-85,
R-1940, R-1830, R-2000; Ranger L-440; Wright
R-1820; plus many other misc. types to lesser
tegree. Elapsed overhaul time, 3-6 weeks. 1957
gross, \$3,164,000; est. 1958 gross \$860,000. Annual outlay for parts, equip., etc., \$45,000
(1958). Inventory, \$200,000. Up to 200 shop
employes. Payroll \$210,000 (1958).
Southwest Airmotive Co., Love Field, Dallas

Southwest Airmotive Co., Love Field, Dallas 7. Tex. In business since 1932. Total engines

the survivors in this business. This is indicated in reports submitted by a representative cross section of the

overhauled, 50,000 (approx.). Types overhauled, Allison J33; Continental E-185, E-225, O-470; Lycoming GO-435, GO-480, GSO-480; P&W R-985, R-1340, R-1820, R-2000, R-2000; Wright R-1820, Elapsed overhaul time, 3-6 weeks, 1957 gross, \$5 million (Acft. & Eng.); est. 1958 gross \$5 million (Acft. & Eng.). Annual outlay for parts, equip., etc., not avail. Inventory, \$2,500,000 (Acft. & Eng.). 389 shop employes. Payroll, \$2,132,000.

AIRCRAFT OVERHAUL

Aero Corp., Atlanta Airport, Atlanta, Ga., In business (under new management) since 1956. Total aircraft overhauled, 669. Equipped to overhaul all types to Douglas C-54 transports, and Hiller H-23 helicopters, etc., 1957 gross, \$1,300,000; est. 1958 gross, \$2 million. Annual outlay for parts, equip., etc., \$600,000. Inventory, \$50,000-\$300,000. Up to 330 shop employes. Payroll, \$700,000/year.

Payroll, \$700,000/year.

Grand Central Aircraft Co., 1100 Air Way.
Glendale, Califi. In business since 1929. Total
aircraft overhauled, 3,180. Equipped to overhaul North American 8-25 through Boeing 8-47.
Beech C-45 through Douglas C-54, North American F-51. T-6 through Lockheed T-33, Convariant,
Douglas, Lockheed transport and executives
types through gross, \$4,250,000; sst. 1958 gross,
\$7,030,000. Annual outlay for parts, equip., etc.,
\$1,825,000. Inventory, \$320,000. 775 shop employes. Payroll, \$4,200,000/year.

ployes. Feyroll, \$4,200,000/year.

Hardwick Aircraft Co., 1612 Chico, El Monte, Calif. In business since 1949. Total aircraft overhauled, 75. Equipped to overhaul Douglas C.47. Lockheed P.38. North American 8-25, P.51, T.6. 1957 gross, \$275,000; est. 1958 gross, \$390,000. Annual outlay for parts, equip., etc., \$60,000. Inventory, \$90,000. 50 shop employes. Payroll, \$200,000.

rayroll, 300,000.

Pacaero Engineering Corp., 3021 Airport Ave., Santa Monica, Calif. Wholly owned subsidiary of Pacific Airmotive Corp. In business since 1950. Total aircraft overhauled, 250 (est.). Equipped to overhaul

industry in response to an AMER-ICAN AVIATION survey. Some of these are detailed below.

types ranging from Beech 18 to Lockheed Contellation. 1957 gross, \$5,678,000; est. 1958 gross, \$4,000,000. Annual outlay for parts, equip., etc., \$2,500,000. Inventory, \$475,000. 250 shop employes. Payroll, \$2,150,000/year.

shop employes. Payroll, \$2,150,000/year.
Pacific Airmotive Corp., 2940 N. Hollywood
Way, Burbank, Calif., and Chino, Calif. In
business since 1928. Total aircraft everhauled,
\$500 (est.). Equipped to overhaul all singleand multi-engine piston- and turbine-powered
land and amphibious aircraft. 1957 gross,
\$10,662,905; est. 1958 gross, \$4,746,442. Annual
outlay for parts, equip., etc., \$2,312,000 (1957).
Inventory \$1,130,000 (1957). Av. 969 shop employes in 1957. Payroll, \$6,122,320 (1957).
Piedmans Avistion, Inc., Smith Revaolck Air-

Piedmont Aviation, Inc., Smith Reynolds Airport, Winston-Salem, N.C., in business since 1940, Total aircraft overhauled, 56. Equipped to overhaul all types to 12,500 lbs., and limited types above 12,500 lbs. inc. Douglas DC-3, Grumman G-73, and Lockheed IR. 1957 gross, \$350,000; est. 1958 gross, \$400,000. Annual outlay for parts, equip., etc., \$125,000. Inventory, \$135,000, 175 shop employes. Payroll, \$280,000/ver.

year.

Southern California Aircraft Corp., Onfario Int'l Airport, Onfario, Calif. In business since 1949. Total aircraft overhauled, 2,000. Equipped to overhaul single- and multi-engine piston- and turbine-powered aircraft ranging, for example, from de Havilland Dove to Douglas D.6-6 and Republic F-84 jet flighters. 1957 gross, \$9,000,000; est. 1958 gross, \$3,000,000. Annual outlay for parts, equip., etc., \$425,000. Inventory, \$50,000. Av. 300 shop employes. Payroll, \$2 million. Southwest Airmotive Co., Love Field, Dallas 9.

Av. 300 shop employes. Payroll, \$2 million.

Southwest Airmotive Co., Love Field, Dallas 9.

Tex. In business since 1932. Total aircraft overhauled, 18,000 (approx.). Specializes in overhaul of single- and multi-engine, piston- and
turbine-powered aircraft from Beech Bonanza
through Convairliner. Will overhaul Fairchild
F-27 and Grumman Gulfstream. 1957 gross and
est. 1958 gross, \$5 million (Acft. & Eng.). Annual outlay for parts, equip., etc., not avail,
Inventory, \$2,500,000 (Acft. and Eng.). 50 shop
employes. Payroll, \$206,000.

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Maintenance Pool Pays Dual Dividends

To their purchases of DC-8s...



SAS, with Caravelles also ordered, could add 880s...



And Swissair could add both 880s and Caravelles . . .



Here's How.

By Anthony Vandyk International Editor

STOCKHOLM, SWEDEN—A unique program for jet age cooperation is being drafted here by executives of Scandinavian Airlines System and Swissair.

- The reason: SAS had purchased 12 Caravelles and 7 DC-8s and needed something in between. Swissair had purchased 3 DC-8s and needed smaller jets. However, neither was in a position to both buy the jets and set up the separate overhaul and maintenance facilities required for additional aircraft types.
- The action: SAS increased its order for Caravelles to 16 and agreed to lease the four added twin jets to Swissair. The Swiss carrier ordered five Convair 880s and agreed to lease two of them to SAS. Under a joint option are six more 880s and SAS has an option on additional Caravelles. SAS will handle major overhaul work on the 10 DC-8s and 16 Caravelles while Swissair will perform major overhauls

on all 880s. Line maintenance will be carried out by both companies.

• The result: Both airlines can operate three different sizes of jet equipment and thus match each of their routes with the aircraft type required.

The agreement, signed last October, represents an evolution rather than a revolution. Cooperation between the two carriers has been growing for many years.

Both have been loyal Douglas supporters and have bought almost every model of the "DC" series produced. It was when the final specifications for the DC-8 were being worked out that the two carriers realized that if they could standardize on one specification they could get a better price out of Douglas. A three-week joint visit to Santa Monica by top officials of the two airlines proved that about \$1 million could be saved. The only difference between the SAS and Swissair aircraft will be in the interior color scheme.

Then, with the DC-8 setting the pat-

tern for cooperation in equipment planning, it was comparatively easy to reach agreement on an identical specification for the Convair 880 and the Caravelle. And the cooperation extends right down the line to manuals. cue a a 8 E

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Each airline will use the same set of manuals for each aircraft type, SAS personnel-flying, technical and operations-will use manuals prepared by Swissair for the Convair 880 while Swissair will use the SAS-prepared manuals for the DC-8 and the Caravelle. All the manuals are being written in English, the language used for all discussions and correspondence on the program for technical cooperation in the jet age. And at Sud-Aviation's training school for Caravelle personnel French instructors are currently giving lessons to Danish, Norwegian and Swedish personnel of SAS in English.

 Facilities shaping up—While SAS and Swissair prepare their personnel for the jet age, their facilities are also being readied to receive the new equipment.

For SAS this has been a twoheaded problem.

First, under the statutes of the threenation airline, work has to be distributed among the facilities at Bromma airport, Stockholm; Kastrup airport, Copenhagen; and Fornebu airport, Oslo.

At the moment, all SAS's Convair 440s are overhauled at Oslo while major overhauls of the airline's four-engine Douglas fleet are carried out at Copenhagen with line maintenance performed at Stockholm. Engine overhaul work is similarly split between the three bases. At the moment SAS has 3,600 technical employes—1,650 at Stockholm, 1,400 at Copenhagen, and 550 at Oslo. The Copenhagen shops are currently working about 50% on foreign aircraft but as the jets are delivered this spare capacity will be used to take care of SAS's own needs.

The second part of the problem facing SAS was that Stockholm's conveniently located Bromma airport couldn't handle American jets. But an agreement has been reached for the airport to be established at Arlanda and it is from this remote spot that SAS's DC-8s and Convair 880s will operate.

Because of its remoteness, SAS de-

cided that the new field would not be used as a major overhaul base. However, it will have a \$10 million hangar and workshops for periodic overhaul and line maintenance of the DC-8s and 880s. Major overhaul work on the DC-8s and Caravelles will be performed at Copenhagen.

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While Denmark will be the main center for major airframe overhaul work. Sweden will be the "host nation" for jet engine overhauls. A \$10 million jet engine overhaul base is being built at Bromma airport, Stockholm, for the P&W JT4 and the Rolls-Royce Avon. Both this facility and the Arlanda hangar and workshops will be ready by 1960. Until the Bromma engine shop is in operation SAS will send its Avons to Rolls-Royce in England for overhaul. While being overhauled these engines will be converted from Stage 1 to Stage 3, giving more power and enabling the Caravelle's gross weight to be increased from 95,600 to 99,000 lbs. (SAS expects to be able to start both the Avon and the P&W JT4 with an overhaul life of 1,000 hours. Some difficulty has been experienced with planning for the JT4 because of security restrictions but it is expected that these will be overcome by next spring.)

Norway's role in the SAS jet overhaul program is less than that of the other two Scandinavian countries since the Oslo base will continue to overhaul the airline's 20 Convair 440s and their P&W R-2800 engines. The present planning calls for these aircraft to remain in service for many years on Scandinavian routes and on certain short-haul services to other European countries. Thus, Oslo will be kept fully

cided that the new field would not be occupied. In fact new maintenance used as a major overhaul base. However, it will have a \$10 million hangar built there.

SAS's jet maintenance program also involves facilities in countries other than Scandinavia. At Idlewild the airline will use a DC-8 hangar built by the Port of New York Authority at a cost of over \$2 million. A DC-8 hangar may also be required in Tokyo while at Los Angeles a nose hangar is seen as desirable.

The Swissair side of the joint partnership for the jet age involves the provision of major overhaul facilities at Zurich for the Convair 880 and its General Electric CJ-805 engine. (Overhaul life of the CJ-805 is expected to start at between 750 and 1,000 hrs.) New hangars and workshops will cost some \$5 million. Swissair will also be set up to perform line maintenance on the Caravelle and the DC-8 in the same way that SAS will be equipped for period overhaul work on the Convair 880.

• Scheduling—The details of the biairline agreement are still being worked out but SAS believes that the overhaul program for the Caravelle and the DC-8 will work out something like this. Each aircraft will have one yearly overhaul at Copenhagen and at that time one block of heavy maintenance work will be performed. Four blocks of heavy maintenance, each comprising a number of aircraft zones, are envisaged. On different aircraft consecutive blocks will be carried out in order to obtain a survey of the complete structure and all systems each year.

Work that can't be postponed until

the annual overhaul will be done in connection with the periodic inspections at Stockholm—or Zurich for Swissair.

According to SAS's present planning all DC-8 annual overhauls at Copenhagen will be carried out in the winter season while, with the possible exception of the initial overhauls, Caravelle overhauls will take place in the summer.

Following is a preliminary plan for scheduling overhaul of aircraft structures and systems in regular operations:

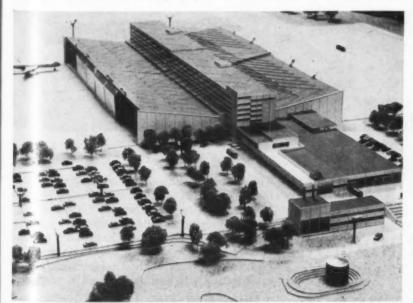
	DC-8	Caravelle
Overhaul work to be distributed on periodic inspections (Stockholm/Zurich)	2,500 hrs. max.	2,000 hrs. max.
Overhaul work to be accomplished on a yearly basis (Copenhagen)	4,000 hrs. max.	3,000 hrs. max.
Major overhaul, 1/4 to be accomplished yearly (Stockholm/- Zurich)	16,000 hrs. max.	12,000 hrs. max.

In the initial stage of DC-8 operation a low time sampling at 2,500 hrs. covering all four blocks of heavy maintenance on one of the first aircraft might be performed. For the Caravelle sampling may be accomplished by letting the first four aircraft undergo the four blocks of heavy maintenance at a maximum of 2,000 hrs. in each case and by making a special thorough inspection on one of the first aircraft after about 500 hrs. flying time. This inspection would not be counted as part of the overhaul schedule.

• SAS, Swissair's jet age begins—SAS will start jet operations next spring with the Caravelle. Sud-Aviation will lend the airline an aircraft in March and April and it is hoped that this will permit SAS flight crews to get in 250 hours of flying training. The first of SAS's own Caravelles should be delivered in March and by mid-June the carrier should have received four. The French jets will be used initially on the routes from Scandinavia to the Near and Middle East.

The first SAS DC-8 will be delivered at the beginning of 1960 and will be used on the New York and Los Angeles routes and on the polar service to Tokyo. Toward the end of 1960 SAS will introduce Convair 880s on its routes to South Africa, South America and the Far East.

Swissair's DC-8 deliveries start in February, 1960 and the aircraft will be used that summer on the New York route. In the same summer Swissair will introduce Caravelles on its Middle East and European routes. The first of Swissair's Convair 880s is due for delivery in the fall of 1960 and will go on the South America and Far East routes.



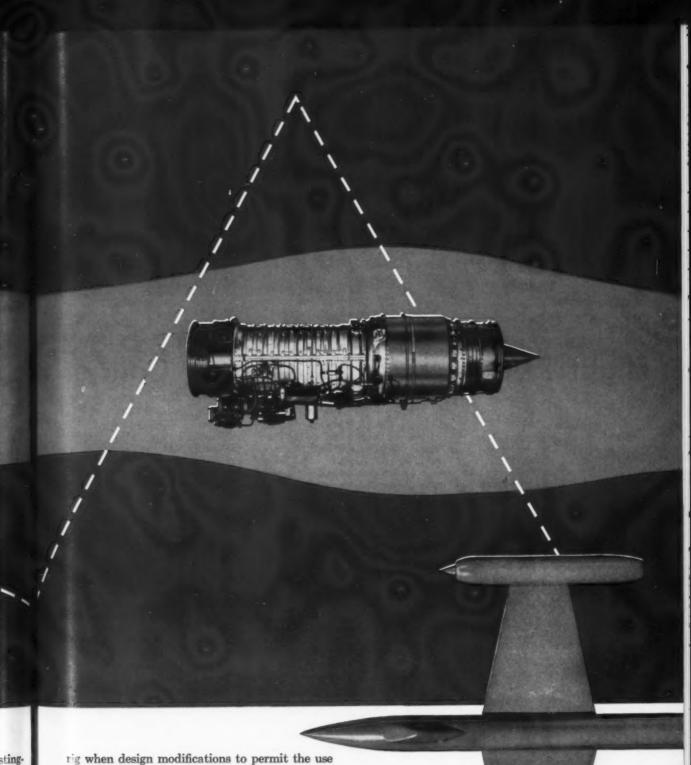
SAS MAINTENANCE BASE at Arlanda will have eight-aircraft capacity in 1963.



Westinghouse proves jet combustion efficiency

This plastic combustor model enables Westinghouse engineers to predetermine combustion efficiencies in turbojet designs. Observations of the flow of the colored water and air bubble mixture permit visual evaluation of air flow patterns in normally unobservable areas of engines. This test method minimizes trial and error testing with handmade metal prototypes.

Development of the latest J34 configuration for use in North American Aviation's T2J trainer proved the value of this water flow analogy test



rig when design modifications to permit the use of avgas and JP-4 or JP-5 were quickly and accurately evaluated. This is just one of the many complete facilities for research, design, development, testing and production of jet engines at the Aviation Gas Turbine Division, Westinghouse Electric Corporation, Box 288, Kansas City, Missouri.

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Circle No. 114 on Reader Service Card.

Despite false rumors, a 11/2-hr. flight demonstrated . . .

- It can be taxied in strong, tricky winds
- It can be landed in a gusty crosswind
- It can be maneuvered at low airspeed in turbulence
- It does not lack control stability



Flight Report: '59 Helio Super Courier

By George Hart Technical Editor

A 15-kt. wind, gusting to 28 kts., was whipping across Washington National Airport one day this month as Lynn Bollinger, Helio Aircraft Corp.'s president, taxied the company's new, five-place model H-395 Super Courier out to the runway for takeoff. I went along to get an on-the-spot idea of what this STOL aircraft will do.

From Bollinger's standpoint, it was a perfect day to show off this 1959 version of his company's plane, because in some quarters, there prevails a misconception that the Courier fails to live up to its billing in a number of areas.

On being cleared onto the runway at Washington National, we got airborne after a run no longer than the taxiway is wide. At 70 mph and an angle of about 45° to the horizon, we climbed at 800 fpm at reduced power and cleared the area. This performance gave a good indication of the plane's capability of clearing a 50-ft. obstacle at a distance of 500 ft. from the start of the take-off run—a still-air requirement for STOL aircraft. Normal, fully loaded climb speed is 95 mph, which gives an initial rate of climb of over 1,500 fpm.

We cruised over to Hyde field, a private pilots' haven in Maryland, where we landed in a strong and gusty, 90° crosswind, approaching at an airspeed of 40 mph, and cutting back to 30 mph as we came over the fence. Power from

the 6-cyl., 295 hp, Lycoming GO-480 swinging a three-bladed 96-in. diam. Hartzell propeller was used to control rate of descent. Angle of attack during the approach was normal for a short field landing, and the touchdown was only very slightly tail low. By stamping on the brakes as soon as the wheels made contact, landing roll was cut to about 60 ft.

After clearing the runway, Bollinger put the Courier through every taxiing maneuver in the book, hands off and arms folded. The tricky wind created no problems at all.

Features which give the new plane its stability on the ground during landing and taxiing include Goodyear crosswind landing gear, and a steerable tail wheel. In addition, the wide-track main gear is set well forward. One disadvantage in a crosswind landing gear is that, if the aircraft is being landed along the side of a slope, there's a tendency to roll downhill. Helio has overcome this by developing a locking mechanism so that, if desired, the wheels may be secured in a normal fore-and-aft position, in which case, conventional ground handling techniques are used.

After takeoff from Hyde field, we flew down the Potomac on a low-altitude, simulated search mission. At airspeeds varying from 30 to 50 mph, we made tight turns as necessary to follow the shoreline. In spite of bumpy weather conditions, the plane handled perfectly, even in slow-speed, downwind turns. Engine cooling during

high-power, low-speed operations is accomplished by means of a large cowl flap on the underside of the fuselage, just forward of the firewall.

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Going up to 7,500 ft. to get out of the turbulence, we tried stalling the aircraft. In this case, the word "stall" gives an erroneous impression, because aileron and rudder control is maintained even when the plane is settling rapidly. When speed is reduced to about 50 mph, aileron control starts to get heavier, and elevator control mushier. These characteristics become more noticeable as speed is reduced further. At 42 mph, airflow separation over the top of the windshield sets up a buzzing sound and, if speed is being reduced with power on, slight tail buffeting ensues.

All this time, the Courier is fully responsive to ailerons, elevator and rudder and, at about 25 mph, the nose falls through to a point just below the horizon. Now, with the yoke all the way back, and power off, the plane maintains its 25-mph airspeed and sinks at 1,200 fpm. But ailerons and rudder are still fully effective, and one only has to be really positive in their application to make the plane bank and turn as desired. In fact, it tends to roll back out of a turn. As with landing, rate of descent may be controlled with engine power.

To demonstrate control stability in smooth air, the aircraft was put into a 30° banked turn at its normal cruise speed of 170 mph. With feet off the rudder pedals, and hands off the wheel,

the plane maintained the 30° bank throughout a 180° turn in each direction. Altitude remained constant, and there was no sign of porpoising.

The Courier was designed by Prof. Otto C. Koppen, in charge of aeronautical design courses at Massachusetts Institute of Technology, and Bollinger's partner in Helio Aircraft Corp. He incorporated four major design features which contribute to the Courier's stability. These are:

- Large expanse of fin and rudder.
 Single-piece, all-flying horizontal "stabilator."
- Automatic, full-span, leading edge slats.
- 4. Slot airflow "interceptors."

The Courier was not fully successful until the flow interceptors were installed. These are metal strips, located in the upper surface of the wings, just aft of the outboard slots. Normally, they are buried in the wing but when actuated by up-aileron control they extend fully by the time the aileron reaches full upward travel.

The interceptors are designed to increase rate of roll and afford positive roll control as speed decreases. Some 40% of the wings' lift is over the slat area at minimum flight speed. By blocking flow through a slat, the lift being generated in that area is reduced, producing greater lift differential between one wing and the other. Thus, the effect of the interceptors phases in as that of the ailerons phases out.

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Helio has sold 103 Couriers of the lighter 260-hp design, which is still being continued, and expects the Super Courier, priced around \$34,000, to boost the company's sales considerably. To date, most sales have been made in foreign countries, particularly in Latin America, for bush flying operations.

-Super Courier Specs-

wing area, 231 s	q. ft.; emp	0"; span, 39' 0"; ty wt., 2,012 lbs.;
gross wt., 3,920	lhe	.; max. industrial
Performance*	Zero wind	10-mnh wind
Max. peed (SL)	176 mnh	
Max, cruise speed	170 mph	
(8,200 feet)	TAG mbu	* * * * * *
Max. nge (10,000		
ft., (46 mph)	942 mit	
Min. Justained	072 1111.1	*****
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Min seed news	45 mpn	
Min. s. eed, power or	oc mpn	(approx.)
Norma climb speed	95 mpn	*****
Sanda Climb	1,550 tpm	
Talantice Ceiling	23,500 11	
Rate f climb Service ceiling Takeor run	217 ft.	130 ft.
lakeon dist. over		
50-11, barrier	475 ft.	331 ft.
Landing roll		
(40° Pap)	169 ft.	99 ft.
Landing dist. over		
50-1. barrier (40 flap)		
(40 flap)	493 ft.	355 ft.
In still air with st	andaud 60	gal first load

Keyboard Device Speeds Flight Data Processing

Control Data Corp., Minneapolis, Minn. has developed a device for high-speed handling of flight data. Called a Controllers Keyboard Input-Output Device, the equipment has been delivered to CAA Technical Development Center for evaluation against similar machines.

The keyboard in effect translates printed words from flight reports of aircraft into alpha-numeric "language" of the computers. In operation, the controller punches information onto the keyboard where numerals and symbols denote altitude, airspeed, wind velocity, and other data.

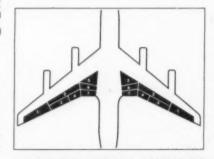
The information characters then go to a static memory unit which holds them until completion of message. At the same time, the complete message is displayed on a screen for visual checking. Operator can flash entire information to the computer, and can have it flashed back to tell whether a change in altitude is safe, whether an airplane can land, or whether it should hold.

A large number of such keyboards could be used with a single computer.

Convair Widening Use of Honeycomb Cores in Aircraft

Sandwich paneling is being used in more than 200 external parts of the Convair 880. Over 1,530 sq. ft. is composed of the high-strength, light-weight material.

The honeycomb core itself is made up of aluminum foil layers .001 in. thick, glued together at alternate points. The glued layers are expanded by special machines from 25 to 100 times size, depending on foil thickness and desired cell size. Sandwich is com-



MAJOR HONEYCOMB ASSEMBLIES in 880 wing surface: 1) trailing edge, 2) intermediate trailing edge and spoiler, 3) flap, 4) aileron, 5) aft wing, 6) inboard trailing edge, 7) inboard flap.

pleted by bonding aluminum skin panels to both sides of the core.

San Diego Division of Convair first used honeycomb for external structure on the F-106, when epoxy resins were developed for adhesives. Epoxy flows up the sides of the core, thus bonding over a larger area.

Lightweight Gas Turbine Supplies Ground Power

Eastern Air Lines is buying a new ground support unit for its Electras. Made by Garrett Corp., it is a lightweight gas turbine, mounted on a panel truck.

The unit supplies electrical power for ground operation of cabin air conditioning and lighting, provides ground check of radio and hydraulic systems, and pneumatically starts the turboprop engines.

Air Force has been using a similar unit, but Eastern's will be first commercial application.

NAA-Telephonics Develop New Parachute Pack Radio

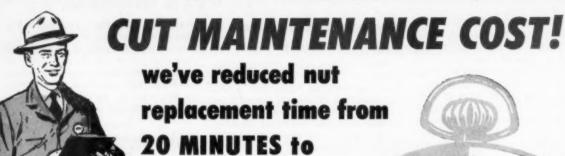
North American Aviation, working with Telephonics Corp., has developed a parachute-pack radio to aid search and rescue operations.

Transmitter sends 140 beats per minute, received on UHF guard channel frequency of 243 megacycles. Transmitter unit is activated by parachute shroud lines on opening.

Unit has 60-mile air-to-air range and 80-mile air-to-ground range.

. . . Engineering Briefs

- General Electric's Service Shops
 Dept. has set up aircraft instrument
 repair centers throughout the country.
 Servicing both jet and conventional instruments, GE has authorized seven
 locations to speed work by cutting
 transportation time to and from factory.
- Hamilton Standard Division of United Aircraft Corp. is producing a new fuel control for 30,000 lb. thrust jet engines. First application is on P&W J-58. Control, called JFC-36, is hydromechanical; automatically meters flow of fuel—accounting for change of pressure, temperature and speed. It also regulates afterburner nozzle diameter and compressor bleeds.
- British Overseas Airways Corp. blames foreign object damage for 42% of the premature engine removals from its de Havilland Comet jet transports.



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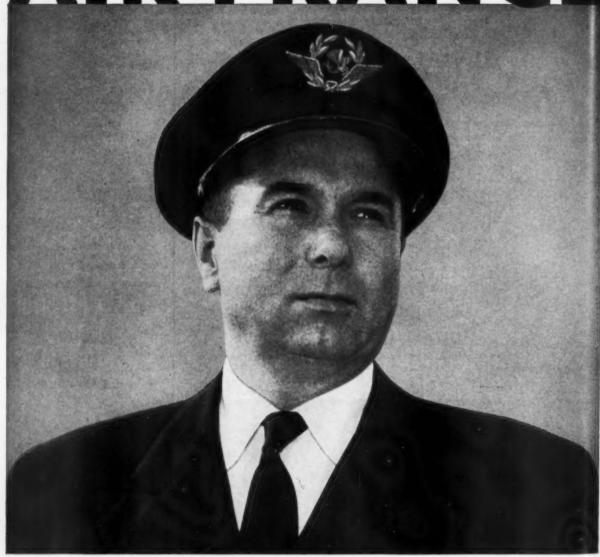
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Baldwin-Lima-Hamilton Corp. Photo

Maintenance Help

Delta's crane will pay for itself in man-hours saved

Delta Air Lines, with the help of a new \$17,460 hydraulic crane, figures it will save an estimated 1,000 manhours annually on engine and propeller changes at its Atlanta overhaul base.

At this rate, and with additional savings gleaned from its use for materials handling chores, Delta expects the new unit to pay for itself in seven vears.

The special crane, built by the Austin-Western Works of Baldwin-Lima-Hamilton Corp. in Aurora, Ill. is a five-ton capacity model used by Delta in place of unwieldy "A" frames for engine and prop changes.

Based on a schedule that calls for more than 50 engine changes per month and a saving of 1.5 manhours per engine, officials of the airline figure the crane saves the equivalent of two work weeks each month.

By extending these savings to the point where they matched the price tag of the new crane, Delta came up with this calculation.

4,656 engine changes in seven years X 1.5 manhours saved per engine = 6,984 manhours saved.

\$2.50 (labor cost per hour) X 6,984 = \$17,460 saved on engine changes.

In addition, use of the crane in the overhaul hangar will save another \$3,150, according to Delta. With a boon extending to 22 ft. and retracting to 14 ft., it has been applied by Delta as a time-saver in removal of rudders, fins and stabilizers from aircraft undergoing overhaul.

selection of the Austin-Western unit is its mobility. It is designed to rotate through full circles and can tip from horizontal to an angle of 40 deg. With both front and rear end steering on a self-propelled chassis, the crane turns a 90-deg. corner in less than its own length.

Although procured primarily for its present piston engine work, Delta anticipates no early obsolesence of the unit with the presence of jet engines in its shop. Its lifting capacity is well above that of the turbines it will operate in its DC-8s and Convair 880s and its use will be merely a matter of adaptation to the new power-

And Delta is not the only airline to pick the Austin-Western crane for its maintenance chores. Pan American placed an order with the company for five similar units, one of which was delivered recently to its new jet maintenance base at New York International Airport.

Money Saver

Engine shipping container slashes cost of transport

Weight savings up to 6,250 lbs. per shipment are being realized by Air Force with a new line of transportation, storage and handling equipment. Designed and developed by Air Logistics Corp. of Pasadena, Calif. under AF contract, the system originally was intended primarily for handling of rocket engines.

However, AF expects to extend its use to jet engines, and other aircraft components. The new equipment utilizes the rail transfer principle pioneered by Air Log, and now standard around many AF maintenance and overhaul facilities, as well as in the supply pipeline.

The two "free-breathing" Mobil-

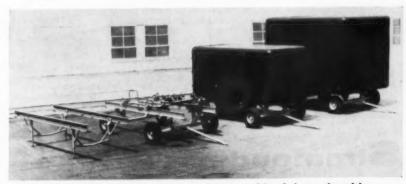
tainers are designed to provide environmental protection for loads to 4,500 lbs. by means of containers made of a uni-directional fiberglass laminate called Paraglas.

Both the large (Model 2910) and small (Model 2900) Mobiltainers contain 134-in, rails set 48 ins, apart, and bolted to the chassis through spacers set in the container floor. Both containers are 156 ins. long, but the Model 2910 weighs 1,550 lbs. and has a capacity of 956 cu. ft. Its overall width is 108 ins. and its height is 129 ins. The smaller Model 2900 measures 95 ins. high x 96 ins. wide, and has a capacity of 436 cu. ft. for a weight of 1,270 lbs. In each case, the chassis has a wheel base of 90 ins. and a tread of 88 ins., allowing towing speeds to 25 mph, and a turn radius of 17 ft.

Size of the Mobiltainers permits their transportation in Douglas C-124 aircraft, in which they were carried during recent AF evaluation tests. These tests also included towing over secondary roads at maximum speed, and a 12-in. drop test. Maximum input to the instrumented load was given as 3.46 Gs. This is surprising, since the load was not carried on shock mounts. But the give in the rails, and the design of the chassis, plus use of 7.50 x 10 tires is said to eliminate the need for shock-absorbing devices.

Last element in the new family is the Model 1210 transportation trailer weighing 725 lbs., and having 8,000lbs. load capacity. A standard AF Model 3100A workstand completes the picture.

The main reasons for AF and Navy interest in the rail concept of maintenance and transportation is that loads are adapted to the rails through rollers. Consequently, when engine designs, etc. change, only the adapters need be discarded, and the trailers and workstands can be continued in service.



One of the big advantages cited for AIR LOG'S MOBILTAINERS are being built in a variety of sizes and models.



Richard H. Schwank

Capital Appoints Schwank New Chief of Procurement

Richard H. Schwank has been appointed director of procurement and supply for Capital Airlines, succeeding George Porter, resigned. Schwank has served as Porter's assistant since August 1956.

The 42-year-old executive has been in aviation sales and purchasing fields for more than 20 years.



MacKenzie Is Appointed FAA-Legislative Liaison

John Ryan MacKenzie has been named Chief, Office of Legislative Liaison, of the Federal Aviation Agency. Formerly congressional liaison officer for the Department of Health, Education and Welfare, MacKenzie will be responsible for advising and assisting the Administrator in the Agency's relations with Members of Congress and congressional committees.

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Reino Elected President Air Traffic Control Assn.

Joseph J. Reino, a charter member and one of the founders of Air Traffic Control Association, has been elected president of the association. He has had 17 years as an active controller and most recently was a vice president and watch supervisor at Washington National Airport Tower.

Other new officers are: Vice president, Charles H. Newpol, 1st Regional Office, CAA; secretary, Cornelius Feyen, CAA Washington Office; treasurer, Joseph C. Few, Jacksonville Center.



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. . . Transport

Karl J. Springer has been elected president and managing director of Pacific Western Airlines Ltd., to succeed Russ Baker who will continue to act as board chairman.

Enrique Chavez, formerly second vice president and a member of the board of directors, has been named first vice president of LAV-The Venezuelan Air-line

Ellis D. Slater, formerly president of Frankfort Distillers Corp., has been elected chairman of the board of the Emery Air Freight Corporation.

M. Lamar Muse, secretary-treasurer of Trans-Texas Airways, has been named president of the Airline Finance and Accounting Conference of the Air Transport Association.

Capt. Fred J. Shaw has been appointed director, flight administration for American Airlines. Florian J. Stevens, Chicago district cargo sales manager for American, has been appointed director, cargo sales service for the airline. A. B. Bowman, recently regional manager, flight for American's eastern region, has been appointed assistant director, dispatch for the system.

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J. J. Davin has been appointed to the staff of the vice president-marketing, United Air Lines, moving from New York City to Chicago.

Col. Earl G. Adams has been named vice president-public relations for Air Carrier Engine Service, Inc.

. . . Manufacturing/Military

D. H. Hollowell succeeds Francis L. Hine as president of Airwork Corporation. Hollowell was formerly vice president of Continental Motors Corp.

Landis Carr, formerly vice president and general manager of Howard Aero, Inc., has joined Fairchild Engine and Airplane Corp. as a customer relations representative.

C. T. Ray will head the new commercial products department of Martin Co.'s Baltimore Division.

Herbert K. Krumel, formerly of Solar Aircraft Company, has joined the marketing stuff, Defense and Technical Products Division, Rheem Manufacturing Co.

W. F. Smith, manager, service publications and methods, for Curtiss-Wright's Wright Aeronautical Division, has been named assistant to the general manager, Princeton Division.

Ha old K. Hatfield has been appointed western regional sales manager of the Kaylork Division of Kaynar Manufacturing (o.

Frenk O. Carroll, retired Air Force Major General, was elected a director of Stanle. Aviation Corp. recently.

Gentrey R. Simmonds, formerly directer at 1 vice president of Simmonds Aerocessones of Canada, Ltd., has been elected president and director of Simmond Aerocessories, Inc.

Moste H. Snedeker, president of Aircraft Engineering Foundation, Inc., resigned to become aeronautical engineer-

ing consultant. The Foundation, its C-46 rehabilitation mission largely completed, is dissolved with Snedeker's departure.

Charles A. Sereno, executive vice president of Electronic Communications, Inc., has been named head of Air Associates Division. Headquarters of the division has been transferred from Glendale, Calif., to St. Petersburg, Fla.

to St. Petersburg, Fla.

Peter H. Lauer, formerly controller of Flexonics Corporation, has been elected treasurer of the corporation, succeeding R. R. Muller who will become general manager of the company's Aeronautical Division.

Merton R. Fallon, formerly product manager of ground support equipment sales, has been named manager of field service engineering for Minneapolis-Honeywell's Aeronautical Division.

Robert K. Leary has been appointed manager of applications engineering, customer relations department, at Stratos Division, Fairchild Engine and Airplane Corp., Bay Shore, L.I.

Harry J. Chapman has been named field representative for the Aviation Products Division of the Goodyear Tire and Rubber Co., with headquarters in Atlanta, Ga.



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- YOU CAN GET DOUBLE WARRANTY PROTECTION AT NO INCREASE IN COST. Airwork sells factory remanufactured engines backed by Airwork's standard warranty, as well as the engine maker's warranty. Your nearest Airwork branch handles any malfunction report. Yet, this service does not add one penny to your cost!
- 2. YOU CAN SAVE SEVERAL HUNDRED DOLLARS BY GETTING AN AIRWORK OVER-HAULED EXCHANGE ENGINE

There's a difference in terminology (and not too much else) between a factory remanufactured engine and an Airwork overhauled engine. Performance wise, only your pocketbook will know the difference.

Airwork overhauls Continental E-185, E-225, O-470 series engines; Lycoming GO-435, GO-480 and GSO-480 series engines to the same high standards and warranted in the same manner as the famous Airwork overhauled Pratt & Whitney Aircraft engines.

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Airwork is the leading overhaul base for P&WA engines used by business aviation in the East. Most of the major corporations depend on Airwork's craft-type overhaul procedures for a more dependable engine. We do not use mechanized production line methods, but treat each overhaul as an individual problem requiring individual attention.

You can buy an exchange engine for immediate delivery, or have your present engine overhauled.

P.S. Let us send you prices and a list of Service Bulletins applying to your engine.

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Asphalt-Concrete Fued Drags On

Asphalt proponents have until December 20 to rebut testimony offered in House subcommittee hearing

The long-standing controversy of asphalt vs portland cement concrete for air strip paving was brought into the open for the fourth time in as many years before a House subcommittee investigating the adequacy of military air strip paving materials,

The hearing conducted by the House Armed Services Subcommittee centered around recently completed tests at the Columbus (Miss.) Air Force Base to determine the ability of flexible (asphaltic concrete) runway interior pavements to withstand heavy loads, such as encountered in normal B-52 operations.

While the conclusion of the Army Corps of Engineers was that "it is possible to construct heavy-load flexible runway interior pavement that will provide adequate service for normal B-52 operation . . . operational conditions may occur that could cause objectionable roughness in flexible pavement because of differential settlement." Therefore, the Corps of Engineers stated, as a general policy, it is "in agreement with the Air Force that a center strip of rigid (portland cement concrete) pavement in runway interiors is good insurance."

The subcommittee's interest in the subject stemmed originally from the 5% premium differential in favor of portland cement concrete (PCC) authorized by the Air Force on alternate bids for rigid and flexible pavements. Opening hearings held in February, 1954, resulted in the unanimous conclusion by the subcommittee that critical areas, such as runway landing ends, warming-up aprons, areas around tanks etc., be constructed of PCC. On non-critical areas, particularly long runw vs. the committee concluded PCC and asphaltic pavement should be considered on a direct comparison of first costs without a price premium. Subsequently PCC construction not only becare competitive but actually drop ed an average 4% in price.

The subject again came up for review in mid-1957 when it was discovered that the Air Force was "essentially perating a concrete paving program. The Air Force contended at the time hat increased loads of the B-52, amounting in excess of 250,000 lbs., or approximately two and a half times that of the B-27, required the change

to rigid pavement for taxiways and runways. Because the testimony was inconclusive, the Columbus test was suggested.

Whether the hearing on the test report is the last on the subject is a moot question. The tests were conducted over a 24-day period simulating a hypothetical 20-year period. Two areas of pavement deformation occurred under the test traffic:

1. A 5/8-in. depression across the width of the traffic test lane in the immediate vicinity of the transition between the flexible and rigid pavement sections of the runway.

2. An average 1½-in. subsidence of the flexible pavement in the wheel lane.

The Asphalt Institute, in testimony at the hearing, described the pavement deflection minor and one that could be "designed right out of further consideration." It discounted the pavement subsidence as "irrelevant" since, it pointed out, the test limited traffic to a 14-ft. traffic lane, whereas normal traffic would be distributed over a 75-ft. wide strip.

The Portland Cement Association challenged the validity of the test on the grounds that the B-52 traffic duplicated in the Columbus test was not "normal" either as to load, speed, braking action or turn around of the aircraft, and that unusually favorable conditions existed-both as to construction and supervision. And the superior quality of natural construction materials on site were not likely to be found at any other air base in the country. The Asphalt Institute disputed the claim and the Navy's similar evaluation of the conditions under which the test section was built. On the contrary, the Institute stated, There were problems involving inferior local aggregates and the project was harassed by almost incessant rains (which) saturated the base materials and seriously jeopardized the entire project."

As a compromise solution a keel approach to surfacing was suggested. In this the center of the runway would be PCC and asphalt would be used on either side where it would not be subjected to repeated heavy loads. This Air Force proposal, endorsed by the Corps of Engineers, was rejected by

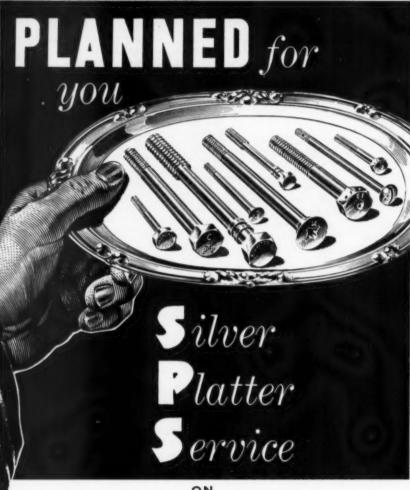
both the portland cement and asphalt group as undesirable.

From testimony presented at the hearing, airline, Navy and Air Force pilots appear agreed on one point. This, as was stated by Brig. Gen. James B. Knapp of SAC, is that the most important characteristic in a pavement, after the basic strength is assured, is surface smoothness. And all apparently agreed that PCC best meets this criteria, particularly for heavy wheel loadings. The Asphalt Institute, pointing to the economic aspect of the hearing, indicated surface smoothness can be maintained to meet this criteria through normal and relatively low cost maintenance of asphaltic pavement.

The Institute and the National Bituminous Concrete Association are preparing a commentary on the Columbus test to be submitted by December 20.

. . . Airport Briefs

- Santa Monica (Calif.) City Council is considering plans for a \$24 million, three-phase, improvement program at Santa Monica Airport. First phase, totaling \$5,681,700, would include a \$2,210,000 office building and a 100-room hotel to cost \$960,000.
- Alamagordo, N.M., expects to get final CAA approval this month to invite bids for start of construction of a new airport the beginning of 1959. Funds amounting to 56% of the estimated half-million-dollar cost of the project are to be supplied by the federal government.
- San Diego, Calif., is dusting off plans, shelved over a year and a half ago, for possible development of Brown Field Auxiliary Air Station as a municipal airport. CAA's 1957 objections to the site have been met in part with the city's annexation of 22 sq. mi. to the Mexican border.
- Dallas (Tex.) City Council is proceeding with plans to construct a \$100,000 terminal building at Red Bird Airport, city-owned general aviation airfield.
- Los Angeles Department of Airports reported net income of \$2,029,411 for the 1957-58 fiscal year. Gross revenues from operations at Los Angeles International and Van Nuys airports reached an all-time high of \$3,983,128, up 10.5% from the preceding year.
- Metropolitan Oakland (Calif.) International Airport had a net operating profit of \$298,590 for fiscal 1957-58. Gross revenue was at a record high.



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BUSINESS FLYING

Fuel Injection

Cessna's new and improved twinengine 310C for 1959 features more powerful fuel injection engines and other major changes in equipment and styling.

Powerplants are Continental 10-470-Ds which have a maximum continuous rating of 260 hp at 2,625 rpm for takeoff. Exhaust noise has been substantially reduced with the installation of new 15 inch mufflers in the aft portion of the nacelles. Augmenter tubes have been shortened and the engine nacelles have been extended to the trailing edge of the wings.

Interior of the 310C has been completely redesigned and restyled. Four new optional seating arrangements are available in addition to the five-place standard interior. One such seating arrangement includes a two-place lounge on the left side of the cabin. A wide variety of interior color combinations is available.

All navigation and communication equipment is grouped in a central panel and includes dual omni, course director, two independent systems of communications, ADF, marker beacon, glide slope, cabin speaker amplifier and audio controls.

Other optional equipment includes a 20-channel ARC type T-22 transmitter, a 20-channel Dare DGS-20 glide slope receiver, a Narco VC-27 Simplexer VHF transceiver and a Dare DM-3 marker beacon receiver. The Narco LFR-38, low frequency receiver and the Narco VOA-3 omni range con-

—— 310C Specifica	rions — —
Dimensions	
Length	27 ft.
Span	36 ft.
Height	10 ft. 6 in.
Weights	
Empty	3,020 lbs.
Gross	4,830 lbs.
Performance	
Max. speed-sea level	242 mph
Cruise speed, 70%	
power @ 8,000'	220 mph
Initial rate of climb	1,800 fpm
Max. range with	
standard 102 gal.	1,070 mi
Max. range with aux.	
fuel (133 gal.)	1,440 mi.

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Cessna Aircraft Co. photo

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Flight and engine instruments are located separately on the left and right

of the communications panel, respectively.

Price of the new 310C remains at \$59,950 f.a.f. Wichita.



New Tricycle Gear, Plastics and Panel on Bellanca 260

The new Bellanca 260, manufacture by Northern Aircraft, Inc., Alexandria, Minn. is powered with a 260-hp Continental fuel injection engine.

Although bearing a resemblance to production Cruisemasters, the new model is a completely redesigned airplane. On the ground, the most noticeable feature is the new retractable tricycle landing gear in place of the tail-wheel gear of the Cruisemaster.

The aircraft is covered entirely with glass fiber reinforced epoxy resin and the engine cowl is a two-piece fiber-glass assembly on honeycomb framing.

Other features of the four-place 260 include a redesigned, larger cabin and a new type instrument panel divided into three sections into which flight, communication and engine instruments are grouped. Each area is color coded for instantaneous reading.

To date, no specifications or performance figures have been released but, according to the company, the aircraft is already in production and delivery of the first models is expected to be made to dealers in February. Production of the standard Cruisemaster will continue.



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FLY THE FINEST... FLY TO TRANS WORLD AIRLINES

The move to cut Air Transport Association's budget flopped. Budget okayed by directors for first half of 1959 is only \$16,000 under same period this year, when \$1.1 million was appropriated. One airline president had favored a 25% slash.

More transatlantic passengers will travel by air this year than by sea. January-September air traffic jumped almost 200,000 passengers over last year. During the same period, ship passengers dropped by 36,737. New economy class fares sparked air travel gain. Drop in flow of immigrants to Canada is said to be one cause of ship decline.

How to increase air travel is the project of a new airline committee, established through the Air Traffic Conference. Airline vice presidents on the market development advisory group will start by mapping a campaign to get travelers out of private autos. Plane-car rental will be played up. They'll also push for state legislation supporting the "Mondayholiday plan"—changing Thanksgiving, Memorial Day, Independence Day, Washington's birthday to Mondays. Including Labor Day, this would result in five long travel-producing weekends.

National Mediation Board is still under fire. Sen. Karl Mundt (R-S.D.) has asked NMB chairman Leverett Edwards why the board requests appointment of Presidential emergency boards in some airline strikes and not in others. No such action was taken in the 102-day Western Air Lines walkout. If a section of the country is deprived of "essential transportation service" in one strike, why not in another, he asks. Mundt hints that this lack of uniformity may lead to Congressional action. And a new University of Illinois study concludes that there is serious question whether the Railway

Labor Act is adequate in promoting good industrial relations for the airlines.

CAB plans to reissue a number of certificates now held by airlines serving Alaska when that territory becomes the 49th state. These will be changed to authorize interstate rather than overseas transportation. CAB also expects that some small carriers operating wholly within Alaska, and not carrying mail, may desire to cancel their certificates because they will be no longer subject to Board authority.

It may one day be a crime to "leak" CAB decisions or try to influence Board cases. This, plus a change in the President's present authority to name agency chairmen, is the gist of two legislative recommendations now being considered by the House Legislative Oversight subcommittee. The group is now drafting a number of recommendations affecting federal regulatory agencies.

The next Congress will have a pile of aviation matters to consider. On the agenda will be several perfecting amendments to the new Federal Aviation Act, continuation of federal aid to airports and additional curbs on Military Air Transport Service. Also in the cards are possible changes in the Railway Labor Act to make its provisions more applicable to aviation.

Capability of the Civil Reserve Air Fleet is worrisome to airline officials who have watched Air Force domination of the Defense Air Transport Administration grow unchecked. The question is whether there'd be enough air transport capacity for the most urgent civil needs if an international crisis caused mobilization. DATA, a Commerce Department bureau, is responsible for both CRAF and the War Air Service Pattern—but DATA is getting all the attention.

Variations in lease agreements for fuel handling equipment are under fire. National Aviation Trades Association is seeking oil company cooperation to come up with some form of standardization. Big problems involved center around assumption of liability and "hold harmless" clauses—subjects of considerable misunderstanding at present.

The long walk for passengers is doomed. CAA Office of Airports Director George F. Borsari has stated that, except for low density airports, two-level terminals will be a must in the jet age. This means no more long concourses, the use of aerobridges and nose-in docking at fingers.

How much terminal space is enough? CAA is looking for some measure of this in a survey. Purpose is to determine present traffic capabilities and get planning data for the future.

It'll be all or nothing on the federal aid to airports program when it goes to Congress again. Any attempt to shave it by reducing aid to terminal building construction will be met by stiff opposition. Oren Harris (D-Ark.), chairman of the House Commerce Committee, recalled "We went through that fight in 1955 when the present program was established." This Congress' mood is the same.

High-visibility paint on all civil aircraft will be required if a CAB proposal doesn't meet crushing opposition. A CAR draft release is being circulated to all affected by the Board's Bureau of Safety for comment by January 15.

Forgotten men in the airline strikes are the concessionaries. But the losses they are taking from traffic reduction will affect airport revenues.

1961 will be turbine year for U.S. airports. At that time, if present delivery schedules are maintained, all that are served by scheduled airlines will be handling the new turbine-powered aircraft.

The design-the-plane-to-the-runways move is alive again. Pressure is mounting to get manufacturers to consider the high cost of real estate and keep the requirements of new commercial aircraft designs within the present capabilities of airports.

Airport aid funds may be jacked up for the jet age. FAA Administrator E. R. Quesada indicated the White House is considering backing legislation to this end. He said, "We are counting on Congress to pass a bill, and I would expect the President to sign it, which will provide funds essential for the improvement of necessary facilities for . . . jet aircraft."

Greenwood, S.C. may have the answer to CAB's "use it or lose it" dictum. The chamber of commerce is soliciting pledges from businessmen and others to use the service of the city's single air carrier at least once in December and to buy and use at least six tickets during 1959. This would bring the number of passengers up to the CAB-required minimum of five a day.

June 30 is the target date for 258 Vortac stations to be installed, tested and ready for commissioning under a CAA program inaugurated this month.

Airports may be missing a \$48-million bet. Only one community has tapped the revolving fund of the Federal Housing and Home Finance Agency thus far for airport planning. Funds advanced for planning purposes bear no interest. And there's no legal obligation to repay if planning falls through.

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The twin-jet T-38 pioneers a new Northrop family of low-cost, high-performance aircraft. Another member, Northrop's N-156F NATO-SEATO counterair fighter, is now being built at Hawthorne, California. Final mockup of the N-156F is shown in background of above illustration.

Both aircraft are evidence of Northrop Division's skill in creating and producing higher quality products at lower cost. With other current projects, the T-38 and N-156F illustrate a new kind of cost-conscious creativity—are results of Northrop's budget-minded management team, the unique Performance and Cost Evaluation Program called PACE, and of Northrop-developed production techniques.



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EXCLUSIVE

Soviet Aviation Is on the Move

By Wayne W. Parrish

Since my first visit to the Soviet Union three years ago, Russian civil aviation has made some significant forward strides.

Not only is progress quite marked, but future plans are on a breathtaking scale.

If any sort of timetable is maintained, the Soviet Union is destined to become the biggest civil aviation nation in the world, perhaps in five years.

Three years ago I flew 4,000 miles on Russian airplanes within the U.S.S.R. and its satellites. I visited four Soviet cities—Leningrad, Moscow, Kiev and Odessa—and the satellite cities of Bucharest, Budapest and Prague.

The only transport planes then flying were old twin-engined LI-2s (the Russian version of the DC-3) and the similar twin-engined IL-12s and IL-14s, the slow workhorses which resemble Convairs but which are much smaller in seating capacity.

It was easy then to assess Russian civil aviation as being 20 years behind the west. It was no further ahead than the West was in 1935 and in some respects wasn't even that far along.

It was different this time. In October, on a 19-day 10,000-mile trip within the U.S.S.R., it was obvious that the Russians had progressed deeply into the jet age. They have leaped entirely from the twin-engined piston era to turbojets, skipping the four-engined piston stages through which the West had passed.

During the coming year, 1959, the Soviets will put into service virtually a complete new fleet of transports, mostly turboprops. (Some of these are a year behind schedule.)

This is the first of a series of articles by the editor and publisher of AMERICAN AVIATION following a 30 000-mile air trip recently concluded which featured 19 days in the U.S.S.R., Poland, Afghanistan, India, Nepal and Turkey. In addition to this series, The Associated Press carried for national distribution a two-part series on civil aviation in Russia under Mr. Parrish's byline.



Photos by Wayne W. Parrish

THE 95-PASSENGER TURBOPROP IL-18 at Tashkent airport in Central Asia. Also taking picture is R. W. Hemphill, well known travel agent of Los Angeles and president of the American Society of Travel Agents who was visiting the U.S.S.R.



A SABENA DC-7 is lined up with two Tu-104As on the apron at Moscow.

A vast airport construction program is under way everywhere. Existing runways are being extended, new ones are being built, ramp areas surfaced—all on an extensive scale.

It is, in total, the most ambitious civil aviation program ever undertaken anywhere. But it is not being accomplished without stresses and strains. There are some trouble areas which will doubtless keep the U.S.S.R. from reaching its goals as fast as it is hoping for.

• Why they're doing it—It is important in any evaluation of Soviet aviation to understand the underlying philosophy behind it. This programming is something the West will have to consider thoroughly.

The U.S.S.R. is a vast country geographically. It has virtually no highway system worthy of the name. Its railroads are inadequate. Up until fairly, recently, the Russian people as a whole traveled very little. Three years ago only the elite, the bureaucrats, the commissars, the chairmen of collective farms, and the like, were permitted to travel by air.

Today there is much freedom of movement for Russians within their own country—even if they can't travel to the West. People have plenty of money and not much to spend it on. They are beginning to travel. Thus the government was faced with a serious transportation problem.

Highway travel cannot be an alternative for many reasons, the chief one being that the U.S.S.R. is producing only a dribble of automobiles and has no intention of supplying the bulk of people with their own cars. And an adequate highway system would strain the economy if it had to be completed in a short time. And then there is the shortage of gasoline.

The railroads have been taxed to the limit. Not only are the rails needed badly for freight movement, but if the government expanded railroad capacity and cars sufficient to meet passenger travel requirements, there would be an enormous strain on the economy. But even if this expansion could be accomplished, rail travel is much too slow for a country the size of the U.S.S.R. For example, rail time between Mos-

-TRANSPORT AVIATION-

. . . Exclusive report on Soviet air transport plans

cow and Irkutsk in Siberia, which is only part way across, is five days.

So the solution to Russia's passenger transportation problem was pretty much foreordained. It was inevitable that air would be the only answer meeting requirements in the economy.

• How they're doing it—It hasn't been generally understood in the West, but the Soviet government has decided on a firm policy to take people off the trunk railroads and put them into the air. All medium and long-haul travel is to be by airplane. Even now it is necessary for a foreigner to go through a lot of red tape to get special permission to travel by railroad. Air is the big item in the Soviet Union today.

As a basic start in this transition, the government has lowered air fares to the level of rail coach. It didn't have to hold a lot of hearings to perform this feat. It's just a part of government policy and went into effect pronto.

It doesn't take much of a projection to reveal the simple fact that transferring of passenger travel to air results in a very great civil aviation potential in terms of airplanes, airports, personnel and ground equipment. No other nation could possibly match it in size.

The reason: In the West the automobile is the primary medium of intercity transportation. In the United States the automobile accounts for 88% of all such passenger travel. The U.S. has become a nation on wheels. Even in Europe the ratio must be very high.

The airplane has become a great essential form of transportation in the United States. But the automobile is a major alternate while the railroad is receding out of the picture entirely. In the U.S.S.R. the airplane is to be the dominant medium with no alternative in the foreseeable future.

The instrument through which this transportation revolution is taking

place is Aeroflot, the big, gangling complex operating as a direct arm of the Red Air Force. Aeroflot is not only an airline, it is civil aviation as a whole. It has complete charge of civil airports including construction. It operates a vast agricultural program for spraying and dusting. It is the complete works.

There is no doubt that Aeroflot is undergoing growing pains. Its organization, from all I could gather, is chaotic. There is no clear line of authority, no organization chart. An effort is being made toward decentralization which will probably help some, but Westerners who have to deal with Aeroflot are struck by the absence of continuity and the lack of clearcut lines of authority to make decisions. But this is a basic weakness in all Soviet governmental setups. Somehow out of the management inefficiency things get done one way or another, usually behind schedule.

• Equipment's improving—But by all odds the most interesting feature of Soviet aviation is the "new look" for its equipment, and the types chosen for expansion.

The airplane best known in the west is the Tu-104, a modified bomber with two turbojet powerplants. This model has been to the U.S. and is flying to numerous points outside the U.S.S.R. I saw no Tu-104s in service, but the Tu-104A, with passenger capacity expanded to 70 seats, is all over the place. Aeroflot officials wouldn't give an answer to the number on hand, but my estimate is between 80 and 100. That's quite a fleet to place in service in less than two years' time.

A new model to seat 100, the Tu-104B, is currently being tested and scheduled for service in 1959. But the Tu-104 type is not a good airplane for many reasons. It is inefficient, it is even



THESE AEROFLOT MEN took WWP to Vnukovo Airport, Moscow, to see the IL-18 in background. They are, left, Peter Yeremasov, asst. chief of the international services dept., and Victor Novash, of the same department.

somewhat hazardous on takeoff and landing, it has very poor pressurization, and its cabin is quite dingy. Having flown 7,850 miles on the Tu-104A, I can testify to all this. While in the air it is smooth and quiet, but there have been at least two fatal accidents and if the Soviet Union were depending on this model to give it world leadership, there wouldn't be anything to worry about.

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But the new 1959 types will be much different. At least the one I was shown, the four turboprop IL-18, definitely has a "new look." I saw the 95-passenger tourist version and it looks good. It isn't of the quality of the Lockheed Electra, for example, not by any means, but it is a vast step forward from the Tu-104 in appearance and materials. It has plastics and light metals and fabrics and galley equipment which is unlike the usual mid-Victorian stuff used by the Russians. It has a roomy and well-equipped cockpit.

It is quite obvious that the Soviet Union will try to export this airplane. The Czechs have already ordered some. It might well appeal to nonsatellite countries that can't afford superior Western equipment. It is a mediumrange job, speed of 380 to 420 mph., and cruising altitude of 27,000 to 30,000 feet. It is ideal for internal Soviet routes as well as routes to the satellite countries. With reduced payload it can fly Moscow to New York with one stop at London or Paris.

In subsequent articles I will tell you about my visit with Aeroflot, what it's like to fly on internal routes by jet, and describe what I know of the other new Russian airplanes coming along.

AEROFLOT FLIGHT 013 bound for Omsk, Irkutsk, Ulan Bator and Peking, a 4,500-mile route, just before boarding passengers at Moscow. It's a Tu-104A.



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On January 6, 1959, the aviation industry takes another huge stride forward. At 3:00 P.M. on that day the first market closing of the Aircraft Exchange will occur.

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t's nd Instead of uncertainty as to values, firm price ranges can now be established. In place of world-wide searching for buyers, sellers, lessors and lessees of transport aircraft, firm bids and offers will be brought together simply, quickly, and in complete secrecy.

Reminder: If you are planning to send in a quotation to buy, sell or lease transport aircraft to be matched with those already being received for the first weekly market, please note it must reach the Aircraft Exchange by 3:00 P.M. January 6th. Regular members may use teletype, international teletype, cable or air mail.

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How much is an airplane worth? Who has aircraft for sale? Where can a buyer be located? Getting the answer to questions like these has cost the aircraft industry untold time and expense. And now with the coming of the jet age these questions become even more important.

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The need for a commodity exchange for transport aircraft is obvious. Such an exchange is now a reality.

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Designed along cooperative lines, the Aircraft Exchange has rigid limitations on its profits, thus cutting to a minimum the cost of aircraft transactions. The cost of membership in the exchange is limited to not more than \$30 a year.

IMMEDIATE INFORMATION AVAILABLE

In order to facilitate the placing of bids and offers for the January 6th market closing, The Aircraft Exchange will air mail full information to any interested organization immediately upon request. Until the Aircraft Exchange's London office is established in January all requests should be sent to the New York address.

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INTERNATIONAL REPORT-

By Anthony Vandyk

How should seating capacity be distributed between first and tourist/economy class? This is a problem that has no easy solution but one European airline has come up with the following estimate of the proportion of first class/de luxe accommodations to be provided on its various routes (expressed as a percentage of total seating available) in the initial period of the jet age.

		Winter	Summer
	Atlantic	25/30	15/20
South	Atlantic	35/40	35/40
Africa		20/25	15/20
Far E	ast	35/40	35/40
Middle	East	20/25	20/25
	*********	15/20	10/15

- · Landmark moved-One of the more familiar features at Vickers-Armstrongs' Weybridge plant has been removed with the delivery to TACA of the Viscount originally ordered by Hughes Tool Corp. This aircraft was stored in the factory for two years before Howard Hughes decided he didn't want it! Until this Viscount's recent delivery to TACA, the airline had been using a leased aircraft for its services between the U.S. and Central America. This leased aircraft probably set some kind of a record for a one-plane operation. In its ten months of "solo" service there were only three cancellations-two due to lack of spare parts and one resulting from a mechanical delay. The Viscount averaged 195 hours' flying and 113 landings each month.
- ATC criticized—The shockingly inadequate air navigation facilities on the North Atlantic have been pointed up by Knut Hagrup, vice president of SAS. He reports that one medium-size Europe airline has estimated that inadequate facilities cost about \$1 million in 1956. An analysis of 1,362 summer flights over the North Atlantic in 1956 reveals that 727 aircraft reported substantial difficulties originating in communications or ATC services. A total of 418 out of 1,153 flights could not get clearance to fly at the altitude requested, while 43 had to change their flight plan after departure because of ATC instructions. Of some 294 flights reporting departure delays, 60 were delayed

awaiting ATC clearance. Air/ground communications failures due to propagation disturbances were reported by 84 flights; 13 of them reported inability to communicate with any ground station for periods of one to two hours while five were out of touch for less than an hour.

- Tightened rules cause shift-The low maintenance standards of certain small independent airlines are drawing increasing criticism in Europe. Biggest offenders seem to be British and German operators. The aircraft most frequently used by the "bad boys" is the Vickers Viking. The Swedish civil aviation authorities recently took measures aimed to prevent inadequately maintained aircraft of nonscheduled operators from using Swedish airports. Henceforward, prior permission must be obtained from the Swedish authorities for each charter flight. The new Swedish regulations have had an immediate effect. Most of the "delinquent" aircraft which formerly operated to and from Swedish airports now use Copenhagen instead.
- Scandinavia nonscheds thrive— Nonscheduled operators have been doing a lot of business in Scandinavia, mainly operating flights to Mediterranean vacation spots under charter to travel agents.
- Automatic landing for BEA-British European Airways has decided that its fleet of de Havilland DH 121 jet transports is to be equipped with automatic blind-landing equipment. BEA is particularly interested in automatic landing equipment because, being a shorthaul operator, it has to make more takeoffs and landings than its longhaul competitors. The highly seasonal nature of BEA's traffic is partly due to the lower punctuality and regularity during the winter months of bad weather. Lord Douglas of Kirtleside, chairman of BEA, has pointed out that much remains to be done before an automatic landing system can become a reality even though the system is now technically feasible. There must be agreement in ICAO on the ground component of the system, and thought must be given to the multiplication of channels in the airborne equipment for safety.

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-TRANSPORT AVIATION-

2nd Cherington Study

"Airline Price Policy" hits management, CAB

"The arrival of new equipment and recent route awards makes it seem probable that the next few years will see a bitter competitive struggle" in airline industry, Paul W. Cherington, Harvard professor of business administration, says in his new book: "Airline Price Policy." Dr. Cherington was the author last summer of the White House study of present airline economic problems.

In this later and larger study, Dr. Cherington is critical of the Civil Aeronautics Board and of its two-year General Passenger Fare Investigation. "Although the board has lectured the carriers from time to time on the necessity of looking at fares and profits on a long-run basis, there is little evidence that the Board itself has followed such a policy," he says.

The CAB's handling of fare changes through what is essentially an adversary proceeding "is open to serious question," Dr. Cherington notes. His study is also critical of some airline management practices, particularly in relying on the "feel" of the market rather than on research facts in deciding whether to initiate price changes.

Among Dr. Cherington's conclusions:

- CAB must give more weight to the prospective needs of the industry for credit and new money when dealing with questions of profits and price levels:
- Top airline management should give continuing attention to fare levels;
- There is a need for closer identification and analysis of existing and potential airline markets and for prompt action in developing these markets with price, service and promotional tools.

Dr. Cherington calls the development of coach fares "the most important development in airline pricing in the last decade." His 500-page study is available for \$7.50 from the Division of Research, Harvard University, Boston 53, Mass.

WAL Pilots Get 12% Boost But Pension Plan Is Axed

An arbitration board in the Western Air Lines-Air Line Pilots Association dispute awarded WAL pilots a wage book of 12% over a 36-month contract period.

Under the contract, retroactive to Oct. 1, 1957 and extending to Oct. 1,

1960, DC-6B captains with nine years or more of service will receive \$1,597 monthly for 85 hours maximum, against a previous \$1,489. This jumps to \$1,671 next March. The board granted \$1 per hour to captains and about half that to copilots flying the Mexico City run, but failed to declare it an international route.

Pilots were guaranteed one hour flight pay for each 2½ hours of duty time beginning June 1, 1959, plus an additional hour for each four hours, effective Jan. 1, 1960. Union pension proposals were denied, but minimum guarantee of \$400 a month retirement pay was established.

William E. Simpkin was arbitration board chairman. Robert Fox represented ALPA.

Northeast Airlines Granted \$3.3 Million for Subsidy

Northeast Airlines has been granted temporary mail pay of \$4.6 million including a subsidy of \$3.3 million for the period from February 7, 1957 through December of this year. CAB said the subsidy was to cover losses for "that portion of its system as it existed prior to the route award to Northeast in the New York-Florida case."

In its application, Northeast said subsidy would be needed until such a time as profits from its New York to Florida operations may offset "the burden of New England losses." During the first nine months of this year, Northeast showed posted losses of nearly \$5 million. About half this amount was chargeable to New England local service operations and the balance to the new Florida route, Northeast said.

Mohawk Would Match Fares If RR Ends Ithaca Service

No-reservations coach flights at railroad coach fares between Ithaca-Buffalo and Ithaca-New York are proposed by Mohawk Airlines if the Lehigh Valley Railroad suspends passenger service at Ithaca. The plan is subject to CAB approval.

Checked baggage would not be provided, but substantial carry-on luggage space would be available. Fare would be \$5.99 Ithaca-Buffalo, \$9.99 Ithaca-New York, with DC-3s or Convairs being used.

CAB Report and Forecast

• Northwest, Eastern, Capital and United were each granted additional route authority in the Board's press release decision in the Twin Cities—Milwaukee-Chicago—case. Northwest was given authority to operate nonstop between Minneapolis/St. Paul and Milwaukee, on the one hand, and certain Florida points, including Miami. Eastern routes were extended from Chicago to the Twin Cities via Milwaukee, with restrictions.

Capital was granted a route extension beyond Chicago to Minneapolis/St. Paul via Milwaukee with authority to operate shuttle service. Capital's present restriction which has allowed service to the Twin Cities and Milwaukee only on flights originating or terminating at Detroit or points east or south of Detroit was removed. United was given authority to serve Milwaukee and Chicago on the same flight, provided such flights extend at least east to Cleveland and west to Omaha.

Since the CAB's decision was issued only in press release form, start of actual service must await the Board's final order and opinion.

• Flurry over the six-airline mutual aid pact, designed by six carriers to help one another out in the event of

a crippling strike, has been quieted temporarily by the Board's order permitting the agreement to operate and setting January 14 as date for oral argument. One unusual proviso in the order requires American, Capital, Eastern, Pan American, TWA, and United to "serve a copy of this order upon each employe organization with which the said six carriers bargain collectively."

- · Surprising the cynics who contend the Board has no serious intentions of carrying the Pan American audit to a final conclusion, an order earlier this month defined the issues in the related Pan American Mail Rate Case. The CAB said that 1954 will be the base year of the study, with the systemwide audit going back to 1951, and further investigation back to 1946. The Board revealed in its order that the CAB staff has now completed its audit for 1954, and said the investigation could now take up such questions as whether Pan American observed sound accounting practices, made proper charges for services rendered to subsidiaries, and in general had made improper claims for mail rate purposes.
- · Board shorties-From a "hands off"

. . . CAB Report & Forecast (cont'd)

policy on the problems of disposal of surplus aircraft, the Board has now named Joe Watson, of the International Division, to head a committee assigned to work on the problem . . . instead of a general meeting of U.S. carriers

interested in the upcoming IATA meeting on jet fares, the Board is calling in the airlines one by one for off-therecord discussions . . . students of the CAB will find much good material in the Board's 150-page policies and operations report to the House Legislative Oversight Subcommittee.

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WEST COAST TALK

By Fred S. Hunter

The aircraft industry has never lacked for rumors, but this year has broken all records for the circulation of false reports and spurious information. An example was the recent story relating to structural damage to the wing of the flight test DC-8 during a simulated emergency descent. The airplane, so the rumor said, had to be landed in the middle of the desert and would require four to six months to repair. Inasmuch as the flight test DC-8 was going along right smartly at the time, flying without interruption, and with all its rivets intact, the Douglas people might have been left somewhat aghast over so wild a rumor except that this was just No. 103 on the list of completely unfounded stories that have been circulated on the DC-8 since it started flying last Memorial Day. Last time we checked, incidentally, the DC-8 had run up 46 test flights and not once had it been necessary to call the airplane in because of a mechanical. And, speaking of rumors, how about the story, gossiped all over town, that Howard Hughes was aboard the Boeing 707 prototype the evening its low approach caused so much commotion at Los Angeles International Airport?

- · Aileron change-The DC-8, we might tell you, is free of the Dutch roll problem and slides down an ILS glide path as slick as a DC-6. But Douglas did make a change in the aileron system. Three of the five small spoilers, installed on each side of the wing for use after landing to increase the weight on the nose wheel, will now also be used for constant sidewind landing. They will open automatically after the aileron has moved eight degrees. Ailerons don't move eight degrees in normal flight so they are not for normal lateral control.
- · One word or three-We'll also tip you off to another DC-8 change that's sure to come. United Air Lines is going to have to change its exterior paint job. The Douglas jetliner is so big the single word "United" inscribed forward on the fuselage, which looks fine on a DC-6 or a DC-7, is lost on a DC-8. Watch

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for UAL to set the name back toward the center of the fuselage and spell it out "United Air Lines" for all to see.

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- Pilots like UTX-North American Aviation won't get rich on the initial order for UTX T-39s from the Air Force, something like seven airplanes, but has no fears of the future. This is an airplane which will catch on fast and the Air Force has a lot of B-25s and C-45s to replace. Pilots like the twinjet UTX for its visibility in all flight altitudes and its low-speed handling characteristics, facilitating operation in the landing pattern. They also say the improved F-86-type leading-edge slats and trailing-edge flaps give the T-39 better stall characteristics even than the F-86A. The UTX also is easy to maintain. Turnarounds may be accomplished in less than an hour
- Helicopter business-The Flying Tiger Line considered trying out an experimental helicopter air freight pickup and delivery service in the Los Angeles area, but decided it would be too costly when estimates indicated each \$1,000 of monthly truck cost would be upped to \$6,000 by helicopter. On the other hand, Calicopters, Inc. is sure it will show savings to companies contracting for the service it has just set up to link industrial concerns located in the San Francisco area by copter.
- Taxi or tow—It looks as though American Airlines will be able to taxi in and taxi out with its Boeing 707s from one of the new flight lounges it has erected at Los Angeles International Airport, but for the other one it will be taxi in, tow out.
- West Coast quickies-Rohr Aircraft Corp., now producing the Boeing assigned sound suppressor and thrus reverser for the 707, is designing a thrust reverser for an F-100F fighter-bomber that North American Aviation is modifying for use in tests on the automatic instrument landing system designed by its Auto etics division . . . Lockheed denie rumors its future plans call for the California division to build only commercial aircraft while the government-owned plant at Marietta builds the military planes.

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EXCITING See Page 56 NEWS

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AD INDEX

AC Spark Plug Div., General Motors Corp
Motors Corp 26
Agency-D. P. Brother & Co.
Aircraft Exchange, Inc 53
Agency—Dowd, Redfield & John- stone, Inc.
Air France
Agency-Batten, Barton, Durstine &
Osborn, Inc.
Airwork Corp 39
Agency-Gene Wyble, Adv.
Avco Mfg. Corp
Avro Aircraft, Ltd
Agency-Cockfield, Brown & Co.,
Ltd.
Frederick B. Ayer & Assoc 56
Agency—Burke Dowling Adams, Inc. Bendix Aviation Corp., Scintilla
Div
Agency-MacManus, John & Adams,
Inc.
Bristol Aero Engines, Ltd 16, 17
Agency-Young & Rubicam, Ltd.
Bulletin Board (Classified) 57
CONVAIR, A Div. of General
Dynamics Corp 12
Agency—Buchanan & Co., Inc. de Havilland Aircraft of Can-
ada, Ltd., The 4
Agency-Paul-Phelan Adv., Ltd.
Delta Air Lines 15
Agency-Burke Dowling Adams, Inc.
Ethiopian Airlines, Inc 56
Agency—St. George & Keyes, Inc. Goodyear Tire & Rubber Co.,
Agency—Kudner Agency, Inc.
Kaman Aircraft Corp., The 50
Agency-Charles Palm & Co., Inc.

Kearfott Co., Inc., Microwave Div
Lockheed Aircraft
Corp 8, 9, 40, 41 Agency—Foote, Cone & Belding
National Aeronautical Corp.
(NARCO) 54 Agency—Davis, Parsons & Stroh-
meier, Inc.
Northrop Aircraft, Inc 49
Agency-Erwin, Wasey, Ruthrauff & Ryan
Nutt-Shel Co 34, 35
Agency—Welsh-Hollander
Puritan Compressed Gas Corp. 54
Simmonds Aerocessories, Inc 38
Agency-Burke Dowling Adams, Inc.
Agency—Burke Dowling Adams, Inc. Sinclair Refining Co
Agency—Morey, Humm & Warwick, Inc.
SPS Western, Div. of Standard
Pressed Steel Co 44, 45
Agency—Sudler Adv.
Texas Co., The
Agency—G. M. Basford Co.
Trans World Airlines, Inc 46 Agency—Foote Cone & Belding
Vickers-Armstrongs (Aircraft),
Ltd
Agency—McCann-Erickson, Inc.
Western Airlines, Inc 6
Agency—Batten, Berton, Durstine & Osborn, Inc.
Westinghouse Electric Corp. 30, 31
Agency-Fuller & Smith & Ross, Inc.
Wilcox Electric Co 2
Agency-Valentine-Radford Adv.



CONTROL ROOM of Rolls-Royce aircraft engine test cell. At left, J. D. Pearson, R-R chairman.

Just for the Record: Best Scotch <u>Does</u> Come to U.S. 100 N

Several years ago I stirred up a few arguments on this page about whisky.

One of the disputes involved the spelling-whisky versus whiskey. The upshot was that Scotch is sold as whisky, the Irish use whiskey, and most American bourbons use whiskey. But there are exceptions. Brown-Forman Distillers of Louisville was founded by George Garvin Brown I, of Scotch-Irish descent, whose first American bourbon labels used whisky and the firm has continued the custom ever since.

But the main battle that ensued (and I'm a little tardy in relating the news to you) involved a guy by name of Philip Gee who runs the public relations com-mittee of The Scotch Whisky Associa-tion, 30 Bruton Street, London W. 1. I don't know whether he's still around, but it's taken me several years to cool off under the collar after some strange letters from him.

I don't like bourbon or rye. I'm a Scotch drinker. I have quite a collection of brands. I have my preferences. Being a loyal Scotch fan I thought maybe that entitled me to bellyache about what I considered to be the poor quality (or low proof) Scotch I find in England and most places around the world. I wrote that the best Scotch is shipped to the U.S. (for which I'm grateful), but I pleaded for somebody to explain what all this proof stuff means, how one distinguishes

as among quality, proof, etc.

In England you note 70 proof Scotch.

In Paris it is labeled 43.4 Gay Lussac.

In the U.S. it's 86.8.

There are all sorts of public relations

people in this world, most of them poorly equipped for their work and pretty lazy.

Once in awhile you find one who's insulting, or patronizing, a guy who has all the answers and considers anybody who asks a question to be a dolt of the lowest order. I confess to the latter, but a public relations guy isn't supposed to point it out.

Gee Whiz, Mr. Gee!

Mr. Philip Gee wrote as follows:

"It's to be hoped Mr. Parrish knows more about aviation than he knows about Scotch Whisky, and has a safer knowledge of flying instruments than of those use for recording the strength of whisky.

"What he evidently doesn't know is that 86.8 American is precisely the same as 75 British and 43.4 Gay Lussac. Does he get into an uproar if the same temperature reads differently by Fahrenheit, Reamur or Centigrade scales? This chap talks too much. But even so, he ought to know that anyone selling Scotch Whisky in England at '60 proof,' 'sweet taste' or sour, would soon find himself in gaol. It's quite clear that Mr. Parrish gets his

palate messed up going places. Or perhaps he started life without one.

"Now let's have the thing straight. Scotch Whisky is exactly the same the whole world over as regards quality. I am tolking of course regards quality. talking, of course, of authentic Scotch. There are well recognized and well respected differences of flavor between the product of one brand-owner and another. and these are the special appeal that each

of them makes to the public.
"But if mixed with different waters, flat
or bubbly, from different countries, how
would anyone in his senses expect it to taste the same?

"If Mr. Parrish doesn't like the 'stuff in England'-and there is no reason why

in England—and there is no reason why he should—there are plenty in England who would cheerfully take on the job."

Thash publish relations? Where dat bum get off? I ashed for help, so I getta kick in de teeth. Howinell wash I t'know about that bum Gay Lussac and why shud I anyhow? Well looka here you Picca-



WWP INSPECTS Rolls-Royce Conway aircraft engine part at Derby, England.

dilly \$!Xc% come over here and you'll

getta sock in dat puss of yours.

So we had some mutually insulting correspondence; no use taking space with it here, but brother Gee finally sent me a booklet (which any good public relations man would have done in the first place) entitled "Scotch Whisky—Questions and Answers."

And in reading the booklet it seems to me the author, a Mr. Philip Gee, made a bum out of the public relations "expert," Mr. Philip Gee.

Mr. Philip Gee.

Because in Questions and Answers, 57 through 60, it is clearly stated that Scotch Whiskey retailed for home consumption (in U.K.) is 70 proof, and for practically all over-seas markets it is usually sold at 75 or 76 proof. And the biggest reason for the lower proof in U.K high for higher proof above 70. So there is a definite difference of strength, which was my main bone of contention in the

first place.

But neither Mr. Gee or his booklet have explained about the 86.8 versus 70 -I mean really explained. The 110-page booklet never even mentions 86.8 proof, which makes me wonder what Mr. Gee does to earn his money.

Dose Bums!

I learned a little more in the booklet about proof. "The short, rough answer is that proof spirit is a mixture of absolute alcohol and water in equal measure." So I knew all along dose bums was loadin'the home stuff wid water, imagine, ruinin' Scotch thataway.

I could give you a lot of details about Scotch distilling but I doubt if you're that much interested. The main thing is, there are big differences in brands and substantial differences in strength. I'm sure that if brother Gee ever came to the U.S. he would delight in the varieties which certainly seem to the better which certainly seem to me to be better in every respect than the stuff they put over the bars in thimblesful in London. Guess he's never tasted really good export Scotch, poor guy.



Rolls-Royce Photos

INSIDE R-R TEST CELL, WWP looks over Tyne engine. Behind him is James H. Stevens, British aviation writer. Right, J. D. Pearson, R-R chairman.

FOR MORE INFORMATION-

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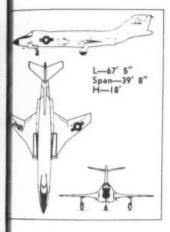
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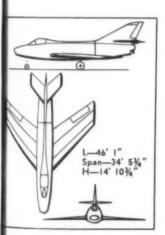
that correspond with numbers appearing beneath items described. Requests will be forwarded to the companies concerned. No additional postage required.



McDONNELL F-101C VOODOO

TYPE: USAF, single-place, twin-engine, jet righter-bomber. WEIGHTS: empty—*; gross—over 50,000 lbs. POWERPLANTS: (2)
Pratt & Whitney J57s; max. rating—approx.
15,000 lbs. st. PERFORMANCE: max. speed over 1,200 mph; range—approx. 2,000 mi.
MFR: McDonnell Aircraft Corp., St. Louis, Mo.

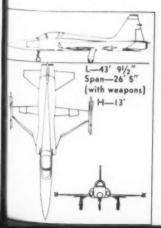
NOTES (for your personal use):



DASSAULT SUPER MYSTERE B.2.

TYPE: Single-place, single-engine, jet fighter-bomber. WEIGHTS: empty-15.250 lbs.: 17PE: Single-place, single-engine, jet fighter-bomber. WEIGHTS: empty—15,250 lbs.; gross—25,300 lbs. POWERPLANT: SNECMA Atar 101 G.3; max. rating—approx. 10,000 lbs. st. PERFORMANCE: max. speed—Mach 1.02; cruise speed—Mach 0.9; endurance—approx. 1 hr.; takeoff ground roll—approx. 2,300'; landing ground roll—approx. 2,000' (with brake chute). MFR: General Aeronautique Marcel Dassault, Saint Cloud, Seine-et-Oise, France. Seine-et-Oise, France.

NOTES (for your personal use):



NORTHROP N-156F

TYPE: single-seat, twin-engine, all-weather counterair jet fighter. WEIGHTS: empty—*; gross—12,120 lbs. POWERPLANTS: (2) General Electric J85s of Fairchild J83s; max. rating—approx. 2,500 lbs. st. with a/b. PERFORMANCE: max. speed—*; cruise speed—*; range—over 2,000 mi. with external tanks. MFR: Northrop Aircraft, Inc., Hawthorne, Calif.
Data classified.

* Data classified. NOTES (for your personal use):

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Aircraft Data

AIRCRAFT SELECTED for the data cards in this issue of AMERICAN AVIATION are the McDonnell F-101C Voodoo, the Dassault Super Mystere B.2 and the Northrop N-156F. McDonnell's F-101C Voodoo has been in squadron service with the Tactical Air Command since May las year. It can perform the role of a fighter and can deliver nuclear weapons The Dassault Super Mystere B.2 is a more advanced version of the Mystere IVB. It is in production for the French Air Force. Northrop's N-156F counterair fighter is designed to fulfill the requirements of NATO and SEATO nations for a defensive aircraft capable of operating from short fields with minimum logistic support.

McDONNELL F-101C VOODOO



Aircraft Data Card December 15, 1958

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DASSAULT SUPER MYSTERE B.2.



Aircraft Data Card December 15, 1958

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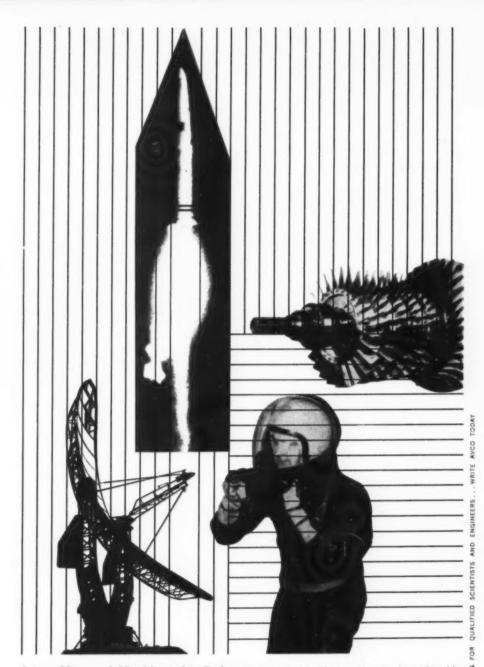
NORTHROP N-156F



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